# Installation Guide
# rp5400 Family of Servers

**Version 3.0**


**Manufacturing Part Number: A5191-96022**
**February 2004**

U.S.A.

# Legal Notices



**IMPORTANT** The latest versions of these documents, and any updates to these documents, are posted under the appropriate server at http://docs.hp.com.

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# 1 Installing Additional Components

# Additional Components

Some internal components are too delicate to be installed in the server prior to shipping. These internal components are shipped with the server, but are packed separately. They can be installed after the cabinet has been unpacked and positioned.

Some of the internal components that are packed separately are not user-installable. To maintain warranty validation, these items *must* be installed by a Hewlett-Packard Customer Engineer.

If you received either (or both) of the components listed below, contact your Hewlett-Packard provider to arrange for installation.

- Central Processing Units (CPUs)
- Power Distribution Units (PDUs)

# Installing Central Processing Units (CPUs)

rp5400 and rp5430 Servers support a maximum of two CPUs.
rp5450 and rp5470 Servers support a maximum of four CPUs.

**CAUTION** Ensure that the following conditions are met before installing a 750 MHz CPU (A6805B):

- HP-UX 11.0/11.i IPR0109 or later is installed.
- PDC firmware revision is 42.19 or later.

Ensure that the following conditions are met before installing an 875 MHz CPU (6152A):

- HP-UX 11.i IPR0206 or later is installed.
- PDC firmware revision is 42.19 or later.

Failure to observe these precautions will result in system failure.

The following rules govern the installation of CPUs in rp54xx Servers:

- CPUs must be installed in the following slot number order: For
  - rp5400 slots 0, 3
  - rp5430 slots 0, 2
  - rp5450 slots 0, 3, 1, 2
  - rp5470 slots 0, 2, 1, 3
- For rp5400 and rp5450 single CPU configurations, a processor terminator must be installed in slot 3. The terminator is not required for rp5430 and rp5470.

**CAUTION** Failure to install the processor terminator, where required, can result in the server failing to pass self-test.

**Step 1.** Power down and *unplug* the rp54xx Server.

**CAUTION** DC voltages are present when the server is connected to AC power. Do not install or service rp54xx internal components while DC voltage is present. Failure to observe this precaution can result in damage to the server.

**Step 2.** Make the top of the server accessible for service.

**Step 3.** Loosen the captive T-15 screws that hold the top cover in place, then grasp the strap handle, raise the cover slightly, and pull the cover toward the front of the server to free the cover tabs from the slots in the chassis. The air baffle will be exposed.

**Step 4.** Loosen the captive T-15 screws on the air baffle. Grasp the two handles on the baffle, and lift the baffle remove it.

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**CAUTION** Observe all electrostatic discharge (ESD) precautions Do not touch internal components. Failure to observe ESD precautions can cause damage to components.

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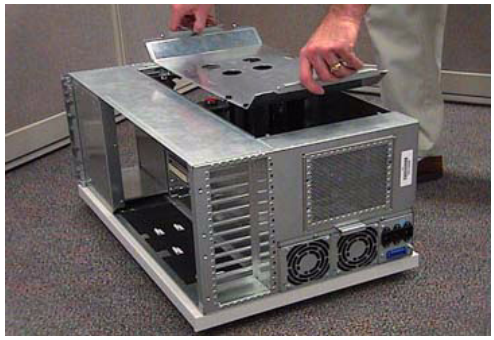
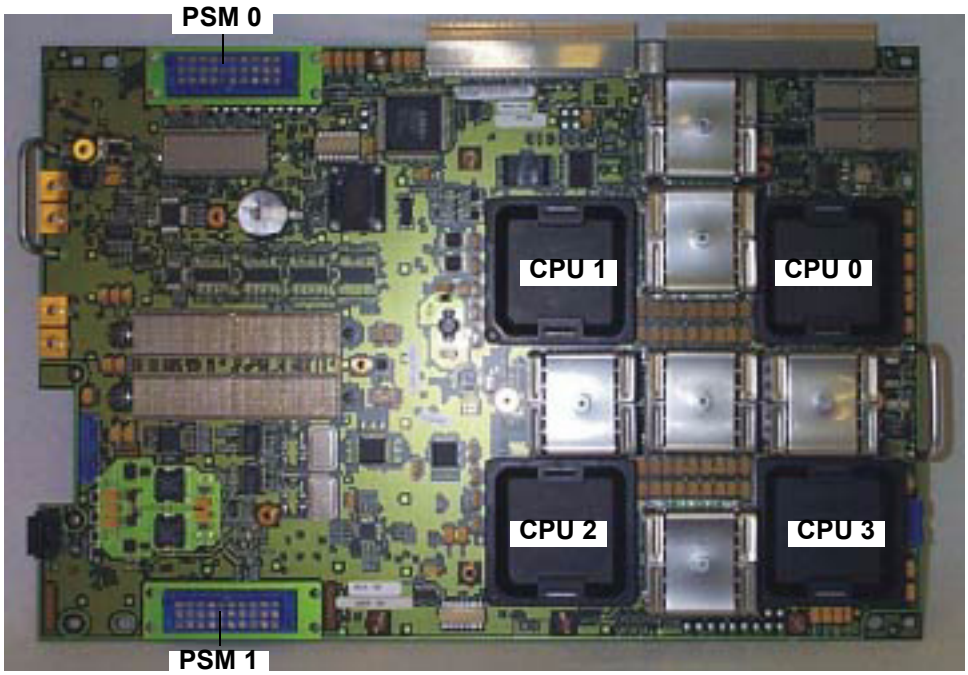


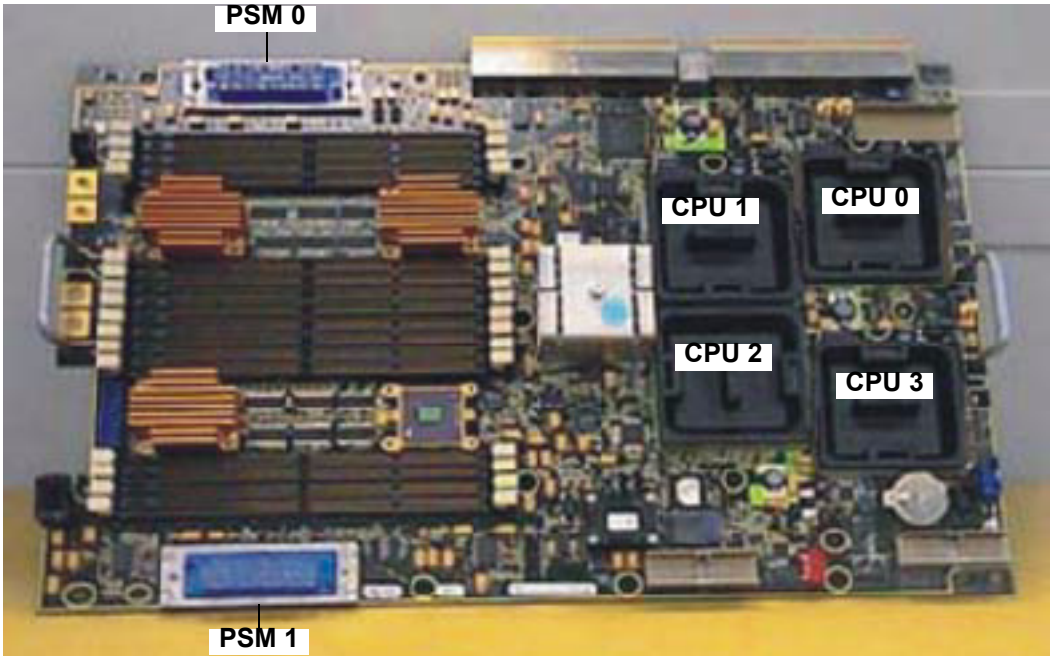
**Step 5.** The following outlines which CPUs and processor support modules are installed for which rp5400 and rp5450 CPU configurations. If installing on an rp5470 proceed to the next step.




**L1000/L2000 System Board**

| Number of CPUs | CPU Numbers to be Installed | PSM Numbers to be Installed |
|---|---|---|
| One | 0 | 0 |
| Two | 0 and 3 | 0 |
| Three[a] | 0, 1, and 3 | 0 and 1 |
| Four[a] | 0, 1, 2, and 3 | 0 and 1 |

**Step 6.** The following outlines which CPUs and processor support modules are installed for which rp5470 CPU configurations.




**L3000 System Board**

| Number of CPUs | CPU Numbers to be Installed | PSM Numbers to be Installed |
|---|---|---|
| One | 0 | 0 |
| Two | 0 and 2 | 0 |
| Three | 0, 1, and 2 | 0 and 1 |
| Four | 0, 1, 2, and 3 | 0 and 1 |

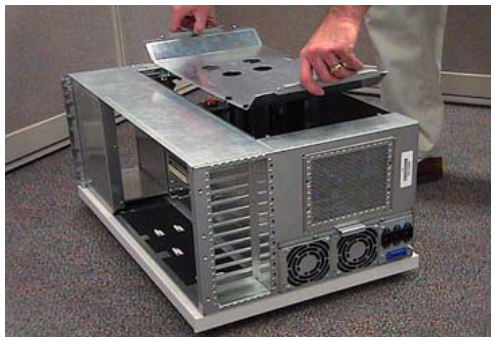
**Step 7.** Perform *CPU Socket Cleaning Procedure* detailed in the *Removal and Replacement* chapter.

**Step 8.** Install processor support modules, as required.

| Number of Processors Installed | Processor Support Modules Required |
|---|---|
| One (1) CPUs | PSM 0 |
| Two (2) CPUs[a] | PSM 0 |
| Three (3) CPUs | PSMs 0 and 1 |
| Four (4) CPUs | PSMs 0 and 1 |

a. If installing a second CPU, on rp5400 or rp5450, remove the processor terminator in slot 3.

**Step 9.** Replace the air baffle. Tighten the four captive screws to secure the air baffle in place.



**Step 10.** Replace the top cover. Tighten the four captive screws to secure the top cover in place.

**Step 11.** For rack configurations, insert the rp54xx Server back into the rack.

**Step 12.** For deskside enclosure configurations, replace the deskside enclosure cover.

**Step 13.** Plug in and power-up the rp54xx Server.

**Step 14.** Use the BCH command `in pr` to verify that the system recognizes the processors that you have just added.

# Installing Memory

## Memory Configuration Rules

rp54xx Servers have 16 slots (8 DIMM pairs) for memory DIMMs. These slots are numbered 0a/b, 1a/b,... 7a/b. 8 of these slots (4a/b - 7a/b) are disabled on rp5400 Servers. rp5450 Servers can access all slots. rp5400 and rp5450 Servers have DIMM slots located on the System Board.

rp5470 Servers install DIMMs using memory carriers. The memory carriers fit into slots on the system Board.

The following rules govern the installation of memory DIMMs for rp5400, rp5450, and rp5470 Servers:

- Memory must be installed in DIMM pairs.
- The capacity of DIMMs within a pair must be the same.
- Install DIMMs with the greatest capacity in the lowest slot numbers.
- Install DIMMs the following slot order: 0a/b, 1a/b, 2a/b, 3a/b, and so on.

### Installing rp5400 and/or rp5450 DIMMs

**Step 1.** Power down and unplug the rp54xx Server.

| | |
|---|---|
| **NOTE** | DC voltages are present when the server is connected to AC power. Do not attempt to install or service: CPUs, memory, PSMs, the platform monitor or PCI I/O cards installed in non-turbo slots (1-6) while DC voltage is present. Failure to observe this warning may result in damage to the server. |

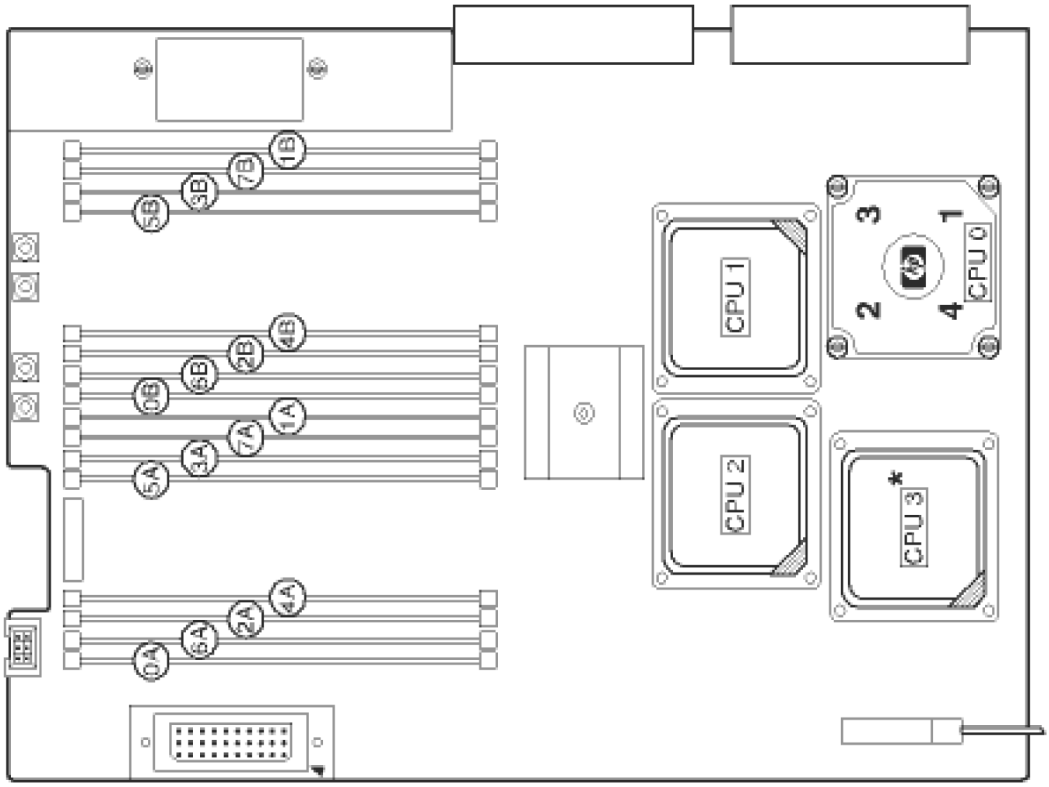
**Step 2.** Make the top of the server accessible for service.

**Step 3.** Loosen the captive T-15 screws that hold the top cover in place, then grasp the strap handle, raise the cover slightly, and pull the cover toward the front of the server to free the cover tabs from the slots in the chassis. The air baffle will be exposed.

**Step 4.** Loosen the four (4) captive T-15 screws on the air baffle. Grasp the two handles on the baffle, and lift and remove the baffle.

**Step 5.** Observe electrostatic discharge (ESD) precautions.

**Step 6.** Refer to the following graphic for memory slot locations.




Locate the correct DIMM pair slots. Insert the DIMM connectors into the guides until the card snaps firmly in place. It may be necessary to apply downward force using the palm of your hand on the DIMM. Observe the top of the DIMM to make sure one side is not higher than the other.

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**NOTE** It may be necessary to remove PSM 1 when installing a DIMM in slot 0a and PSM 0 when installing a DIMM in slot 1b. If either PSM is removed to install memory, ensure it is re-installed.

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**Step 7.** Replace the air baffle. Tighten the four captive screws to secure the air baffle in place.

**Step 8.** Replace the top cover. Slide the cover tabs into the slots in the chassis and close the cover. Tighten the two captive screws to secure the top cover in place.

**Step 9.** For rack configurations, insert the rp54xx Server back into the rack.

**Step 10.** For deskside enclosure configurations, replace the deskside enclosure cover.

**Step 11.** Power the rp54xx Server on.

**Step 12.** Use the BCH command `in me` to verify the system recognizes the memory that you have just added.

### Installing rp5470 DIMMs

**Step 1.** Power down and unplug the rp54xx Server.

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**NOTE** DC voltages are present when the server is connected to AC power. Do not attempt to install or service: CPUs, memory, PSMs, the platform monitor or PCI I/O cards installed in non-turbo slots (1-6) while DC voltage is present. Failure to observe this warning may result in damage to the server.

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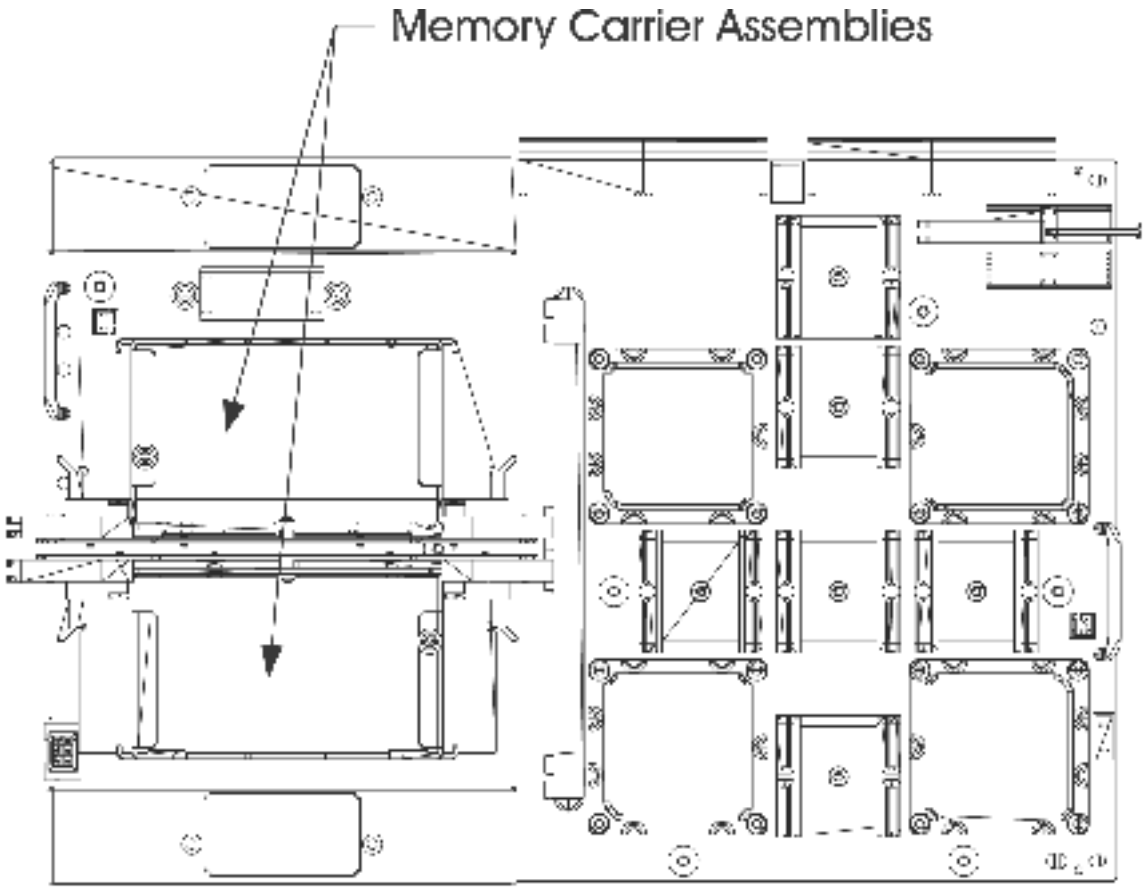
**Step 2.** Make the top of the server accessible for service.

**Step 3.** Loosen the captive T-15 screws that hold the top cover in place, then grasp the strap handle, raise the cover slightly, and pull the cover toward the front of the server to free the cover tabs from the slots in the chassis. The air baffle will be exposed.

**Step 4.** Loosen the four (4) captive T-15 screws on the air baffle. Grasp the two handles on the baffle, and lift and remove the baffle.

**Step 5.** Observe electrostatic discharge (ESD) precautions.

**Step 6.** Refer to the following graphic for memory carrier locations.



a. Locate the memory carrier and pull up on the extractor levers on each end of the memory carrier to unseat the memory carrier from its socket.

b. When the memory carrier unseats from the socket, pull it away from the System Board.

c. Loosen the captive screws that secure the DIMM Clip and remove the DIMM Clip from the memory carrier.

d. Seat the memory DIMM into its socket on the memory carrier.

e. Press the extractor levers on each end of the memory DIMM slot inward until the levers snap into place.

f. Attach the memory clip to the memory carrier with the DIMM slot markings on the top of the memory clip aligned with the DIMM slot markings on the memory carrier.

g. Secure the memory clip using the captive screws.

h. Seat the memory carrier into the appropriate slot on the System Board.

i. Push down on the extractor levers and snap them into place.

**Step 7.** Replace the air baffle. Tighten the four captive screws to secure the air baffle in place.

**Step 8.** Replace the top cover. Slide the cover tabs into the slots in the chassis and close the cover. Tighten the two captive screws to secure the top cover in place.

**Step 9.** For rack configurations, insert the rp54xx Server back into the rack.

**Step 10.** For deskside enclosure configurations, replace the deskside enclosure cover.

**Step 11.** Power the rp54xx Server on.

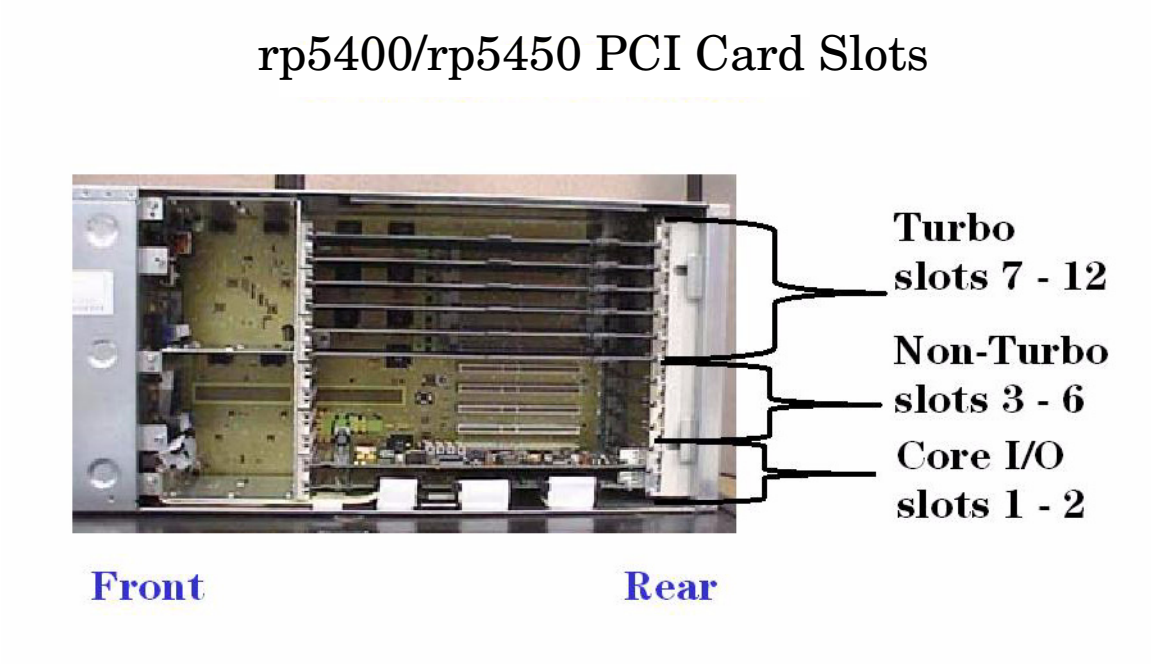
**Step 12.** Use the BCH command `in me` to verify the system recognizes the memory that you have just added.

# Installing Peripheral Component Interconnect (PCI) Cards

rp54xx Servers have a total of 12 PCI I/O slots. Slots 1 and 2 are reserved for the LAN/SCSI and GSP Core I/O cards, leaving 10 PCI I/O slots available for twin use.

## rp5400/rp5450 PCI Card Slots

For rp5400 and rp5450 models, 10 PCI I/O slots consist of turbo and non-turbo slots. Server PCI slots are shown below.




- Slots 1 and 2 are reserved for the rp54xx LAN/SCSI and GSP (Guardian Service Processor) Core I/O cards, respectively. Slots 1 and 2 are non-turbo slots. Non-turbo slots share a single 250MB/s PCI bus and are incapable of hot-plug functionality. The server must be turned off prior to removing or installing the LAN/SCSI or GSP cards in these slots.
- Slots 3 - 6 are non-turbo slots. These four Non-turbo slots share a single 250MB/s PCI bus, run at 33MHz and support 32 and 64-bit PCI cards. Non-turbo slots are incapable of hot-plug functionality. The server must be turned off prior to removing or installing PCI cards in these slots.
- Slots 7 - 12 are turbo slots. Each turbo slot has a dedicated 250MB/s PCI bus, run at 66MHz and support 32 and 64-bit PCI cards. Turbo slots are hot-plug capable. Below each turbo slot is a plastic PCI card separator. The PCI card separator has two LEDs and a pull tab on the outer edge. The LED's provide power and status for the slot. The pull tab allows the PCI card to be easily removed.

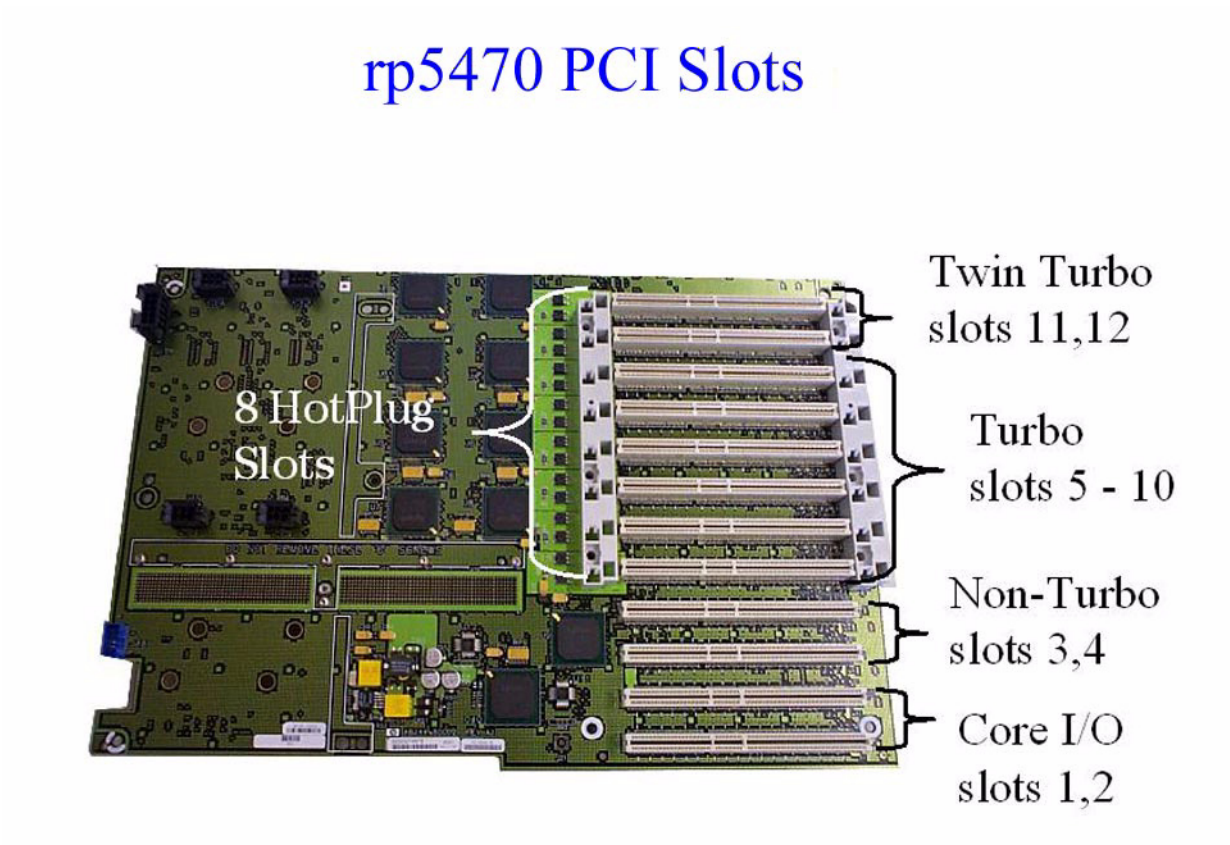
rp5400 Servers have access to slots 1, 2 and 8-12 while rp5450 Servers have access to all (1-12) slots.

**NOTE** Slot 3 will become enabled on rp5400 Servers with server firmware versions later than 40.48.

A slot 3 enabled label (A5576-84009) is available for rp5400 systems.

## rp5470 PCI Card Slots

For rp5470 models, the 10 PCI I/O slots consist of twin turbo, turbo, and non-turbo slots. The following illustration shows the PCI card slot layout.




- Slots 1 and 2 are reserved for the rp54xx LAN/SCSI and GSP (Guardian Service Processor) Core I/O cards, respectively. Slots 1 and 2 are non-turbo slots. Non-turbo slots share a single 250MB/s PCI bus and are incapable of hot-plug functionality. The server must be turned off prior to removing or installing the LAN/SCSI or GSP cards in these slots.
- Slots 3 and 4 are non-turbo slots. These two Non-turbo slots share a single 250MB/s PCI bus, run at 33MHz and support 32 and 64-bit PCI cards. Non-turbo slots are incapable of hot-plug functionality. The server must be turned off prior to removing or installing PCI cards in these slots.
- Slots 5 - 10 are turbo slots. Each turbo slot has a dedicated 250MB/s PCI bus, run at 66MHz and support 32 and 64-bit PCI cards. turbo slots are hot-plug capable. Below each turbo slot is a plastic PCI card separator. The PCI card separator has two LEDs and a pull tab on the outer edge. The LED's provide power and status for the slot. The pull tab allows the PCI card to be easily removed.
- Slots 11 and 12 are twin turbo slots. Each twin turbo slot has a dedicated 500MB/S PCI bus, runs at 66 MHz, and supports 32- and 64-bit PCI cards. Twin turbo slots are hot-plug capable. Below each twin turbo slot is a plastic PCI card separator. The PCI card separator has two LEDs and a pull tab on the outer edge. The LED's provide power and status for the slot and the pull tab allows the PCI card to be easily removed.

rp5470 Servers have access to all (1-12) slots.

## PCI I/O Card Installation Restrictions

Restrictions apply regarding the installation of PCI I/O cards which contain a PCI-to-PCI bridge:

- HP-UX boot is currently not supported for cards which contain a PCI-to-PCI bridge.
- HP-UX patches are required when more than one card containing a PCI-to-PCI bridge is installed in non-turbo slots.

## PCI I/O Card Installation Order

The following table shows a standard factory PCI card installation that begins with slot 12. Use this table as a guideline for installing PCI I/O cards in the field.

**NOTE** A system shipped from the factory may have a different configuration than the same system built in the field. For example: The factory will install the graphics card in slot 12 and add other cards below. In the field, slot 12 may already be occupied by another PCI card. It is acceptable for the graphics card to be installed in any available turbo slot.

| Product Number | Description (all are PCI cards) | Max | Boot | Load Order * | Part Number | Notes |
|---|---|---|---|---|---|---|
| A6150A | Graphics, Graphics Card | 1 | No | 1 | A4982-66501 | 3,8 |
| A5838A | Combo | | No | 3 | A5838-60001 | 9 |
| A5483A | ATM 622Mbps MMF Adapter | 10 | No | 4 | A5483-60001 | 10 |
| A4926A | 1000Base SX PCI LAN Adapter | 10 | No | 5 | A4926-60001 | |
| A4926A | 1000Base TX PCI LAN Adapter | 10 | No | 6 | A4926-60001 | |
| A6092A | HYPERFabric | | No | 7 | A6092-60001 | 11 |
| A5158A | FC Taclite | | Y | 8 | A5846-60001 | |
| A5486A | Praesidium Speed Card | 10 | No | 9 | A5486-60001 | |
| A5506A | 4 Port 100Base TX LAN Adapter | 7/10 | No | 10 | A5506-60101 | 1,2,6 |
| A5506B | 4 Port 100Base TX LAN Adapter | 7/10 | No | 10 | A5506-60102 | |
| A5150A | Dual Port Ultra 2 SCSI adapter | 10 | Yes | 11 | A5150-60001 | 4 |
| A5149A | Single Port Ultra 2 SCSI HBA | 10 | Yes | 12 | A5149-60001 | |
| J3526A | High Perf 4 Ports Synchronous Adapter | 10 | No | 13 | 5063-1322 | 7,5 |
| A4800A | FWD SCSI-2 adapter | 10 | Yes | 14 | A4800-67002 | |
| A5230A | 100Base-T LAN Adapter | 10 | No | 15 | B5509-66001 | |
| A3738A | 10/100Base-T LAN Adapter | 10 | No | 16 | A3738-60001 | |
| A3739A | Dual FDDI LAN Adapter | 10 | No | 17 | A3739-60001 | |
| A5783A | Token Ring 4/16/100 Hardware Adapter | 10 | No | 18 | A5783-60101 | |

| Product Number | Description (all are PCI cards) | Max | Boot | Load Order * | Part Number | Notes |
|---|---|---|---|---|---|---|
| J3525A | Dual Port Synchronous Adapter | 10 | No | 19 | J3525-60001 | |
| J3593A | 64 port Serial MUX system card | 10 | No | 20 | J3593-60001 | |
| J3592A | 8 Port PCI Serial MUX card | 4 | No | 21 | J3592-60101 | |
| A6150A | Graphics, USB Card | 1 | No | 22 | A6150-60001 | |
| A6150BX | Pinnacle 2 Graphics | 1 | No | 1 | A6150-60003 | 12,13 |
| A6386A | Hyper Fabric 2 Interconnect | 10 | No | 6 | A3686-60001 | |
| A5506A | Quad Port 10/100B-TX LAN | 10 | No | 10 | A5506-60102 | 14 |
| A6749A | 3.3v 64 Port Terminal MUX | 10 | No | 24 | A6749-60001 | |
| A6748A | 3.3v 8 Port Terminal MUX | 10 | No | 25 | A6748-60001 | |

*In top down order.

**Notes:**

1. Card contains a PCI-to-PCI bridge.
2. Requires PHKL_20123, PHKL_20629 and PHNE_19826 or their superseded equivalents.
3. Not supported in non-turbo slots. Install in turbo slots only.
4. Requires server firmware revision 39.46 or later.
5. Requires HP-UX 11.1
6. Maximum is 7 for HP-UX versions prior to 11.0. Maximum is 10 for HP-UX version 11.1 and later.
7. Requires PHKL_19543 and PHKL_19544 or their superseded equivalents.
8. Requires HP-UX 11.0 Support Plus (IPR) 0006, June 2000 or later. This product to be released 6/00.
9. Not supported in a shared slot (slots 3-4 for rp5470, slots 3-6 for rp5450, not applicable for rp5400).
10. If you are installing ATM 622 cards in an rp5470 configuration, do not install them in slots 3 and 4 (shared slots).
11. Requires 768 MB for first card and 512 MB for each additional card.
12. Not supported in shared slots.
13. Max of 1. Needs USB card for keyboard and mouse.
14. Contains PCI bridge.

## Installing a PCI Card

Follow these procedures to install a PCI card.

**Step 1.** Power down and unplug the rp54xx Server.

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**NOTE** DC voltages are present when the server is connected to AC power. Do not attempt to install or service: CPUs, memory, PSMs, the platform monitor or PCI I/O cards installed in non-turbo slots (1-6) while DC voltage is present. Failure to observe this warning may result in damage to the server.

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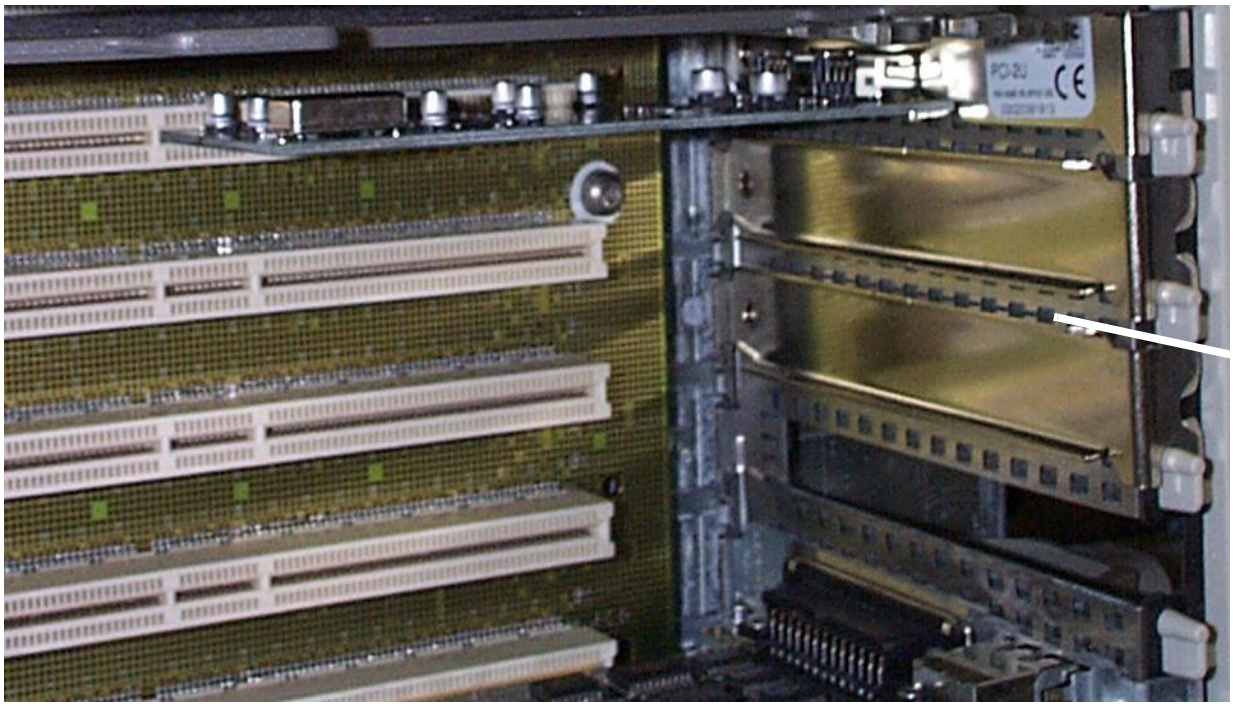
**Step 2.** Make the right side of the server accessible for service.

**Step 3.** Using a torx 15 screwdriver, loosen the captive screws on the right side panel. This panel has a label which shows which PCI I/O slots are available and the corresponding paths. The PCI I/O slot paths for rp5400, rp5450, and rp5470 are shown below.

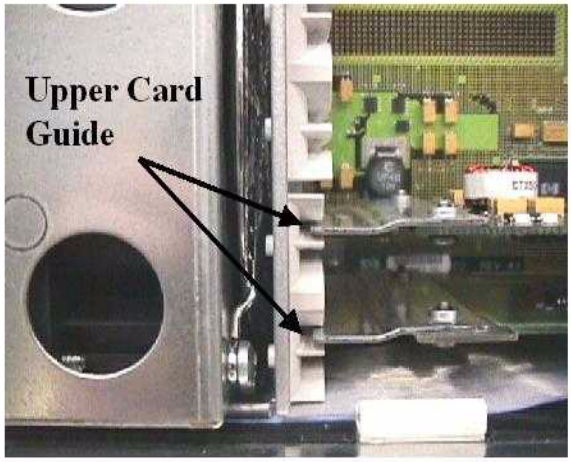
| Slot | rp5400 | | rp5450 | | rp5430/rp5470 | |
|---|---|---|---|---|---|---|
| | **Slot Type** | **Path** | **Slot/Type** | **Path** | **Slot Type** | **Path** |
| **12** | **Turbo** | **0/4/0** | **Turbo** | **0/4/0** | **Twin Turbo** | **0/10/0** |
| 11 | Turbo | 0/7/0 | Turbo | 0/7/0 | Twin Turbo | 0/12/0 |
| 10 | Turbo | 0/3/0 | Turbo | 0/3/0 | Turbo | 0/8/0 |
| 9 | Turbo | 0/6/0 | Turbo | 0/6/0 | Turbo | 0/9/0 |
| 8 | Turbo | 0/2/0 | Turbo | 0/2/0 | Turbo | 0/3/0 |
| 7 | Not Available | | Turbo | 0/5/0 | Turbo[1] | 0/1/0 |
| 6 | Not Available | | Shared | 0/1/0 | Turbo[1] | 0/5/0 |
| 5 | Not Available | | Shared | 0/1/1 | Turbo[1] | 0/2/0 |
| 4 | Not Available | | Shared | 0/1/2 | Shared[1] | 0/4/0 |
| 3 | Not Available[2] | | Shared | 0/1/3 | Shared | 0/4/2 |
| 2 | GSP | | GSP | | GSP | |
| 1 | LAN/SCSI | | LAN/SCSI | | LAN/SCSI | |

1. Slot is NOT AVAILABLE for rp5430.
2. Slot 3 becomes available with server firmware versions later than 40.48.

**Step 4.** Remove the PCI slot cover from the slot that will receive the PCI card. To remove the PCI slot cover, slide the PCI slot cover away from the server.



**Step 5.** Slide the PCI card connectors into the slot, snapping firmly in place. For full length (cards that extend to the left side card guides) PCI cards, use the UPPER card guide.




**Step 6.** At the rear of the chassis, connect the I/O cable to the card just installed.

**Step 7.** Replace the right side panel and tighten the captive screws.

**Step 8.** For rack configurations, insert the rp54xx Server back into the rack.

**Step 9.** For deskside enclosure configurations, replace the deskside enclosure cover.

**Step 10.** Power the server on.

**Step 11.** Use the server firmware `in io` command to verify the PCI cards are recognized by the server. If AUTOBOOT is ON, it will be necessary to interrupt the boot process to get to the server firmware `Main Menu: Enter command or menu >` prompt.

**Step 12.** Boot HP-UX and run the `ioscan` utility to verify the system recognizes the new PCI card.

## Online Addition/Replacement (OLA/R) of PCI I/O cards

Beginning with HP-UX 11i (11.11) rp54xx Servers support the on-line addition and replacement of PCI I/O cards. In order for this high availability feature to be fully implemented, the following server requirements must be met:

- rp5400A/rp5450A firmware must be later than 40.26 (rp5400B/rp5450B/rp5470A firmware will support OLA/R upon its release).
- HP-UX operating system must be 11i (11.11) or later.

There is a bit that the HP-UX operating system examines to determine if the server hardware and firmware is capable of OLA/R. This bit is controlled by server firmware. If the bit is ON, OLA/R is possible (when requirements have been met). The bit was mistakenly set to ON for all rp5400 and rp5450 revision A (rp5400A and rp5450A) servers. As a result, HP-UX may incorrectly identify these models as being OLA/R capable. In order to avoid this confusion, verify that the correct level of server firmware is installed.

# Installing Graphics

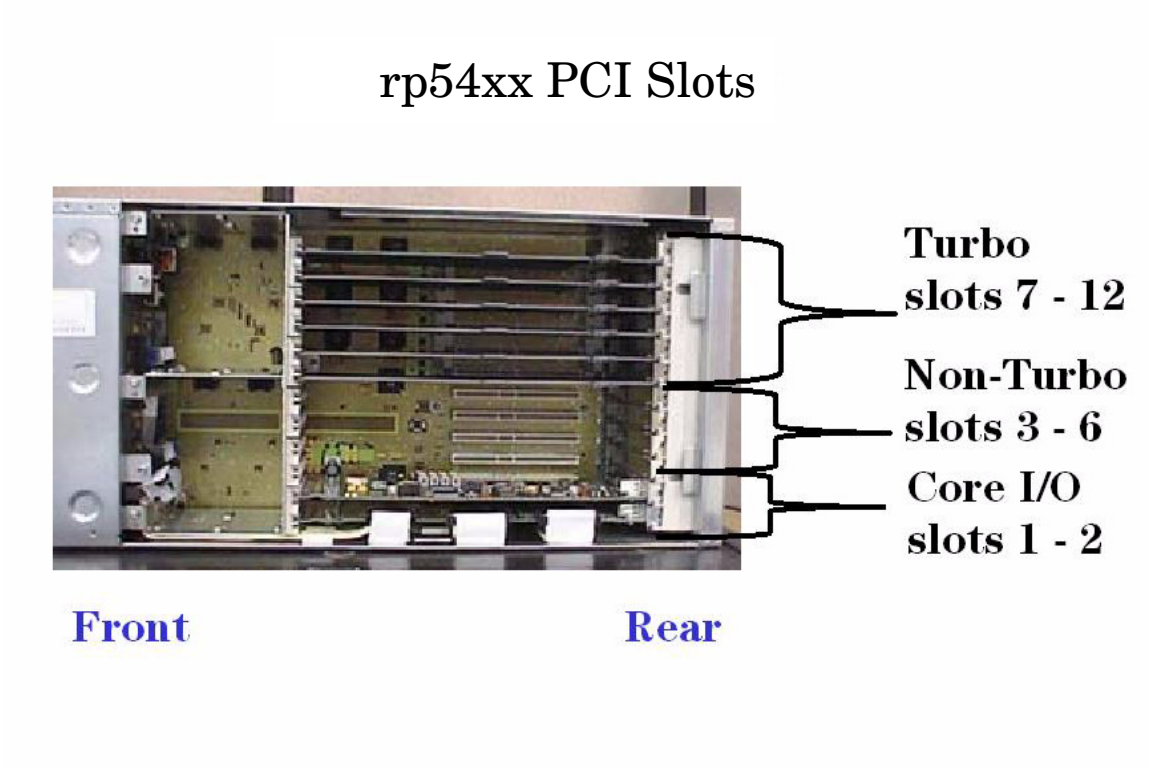
This section explains how to install rp54xx 2D graphics hardware. For a complete graphics solution, three products are required. The products listed below are the only products supported on rp54xx Servers.

- A6150A rp54xx Graphics Package
  - — Includes PCI graphics card
  - — Includes PCI USB (Universal Serial Bus) card
- A4983B Keyboard and Mouse Kit
  - — Includes mouse with 114” cable
  - — Includes keyboard with 109” cable
- D8910W (19”) or D2847W (21)” Monitor
  - — Includes localized power cord and 75” 15-pin video cable

**NOTE** rp54xx graphics requires HP-UX 11.0 Support Plus (IPR) 0006, June 2000 or later.

The photo below includes the A6150A, A4983B and D8910W products. The video cable for the monitor is not shown. Black ESD mat not included.

rp54xx Servers have a total of 12 PCI I/O slots. Slots 1 and 2 are reserved for the LAN/SCSI and GSP Core I/O cards, leaving 10 PCI I/O slots available for twin use. These 10 PCI I/O slots consist of turbo and non-turbo slots.




- Slots 1 and 2 are reserved for the rp54xx LAN/SCSI and GSP (Guardian Service Processor) Core I/O cards, respectively. Slots 1 and 2 are non-turbo slots. Non-turbo slots share a single 250MB/s PCI bus. Non-turbo slots are incapable of hot-plug functionality. The server must be turned off prior to removing or installing the LAN/SCSI or GSP cards in these slots.
- Slots 3 - 6 are non-turbo slots. These four Non-turbo slots share a single 250MB/s PCI bus, run at 33MHz and support 32 and 64-bit PCI cards. Non-turbo slots are incapable of hot-plug functionality. The server must be turned off prior to removing or installing PCI cards in these slots.
- Slots 7 - 12 are turbo slots. Each turbo slot has a dedicated 250MB/s PCI bus, run at 66MHz and support 32 and 64-bit PCI cards. Turbo slots are hot-plug capable. Below each turbo slot is a plastic PCI card separator. The PCI card separator has two LEDs and a pull tab on the outer edge. The LED's provide power and status for the slot. The pull tab allows the PCI card to be easily removed.

rp5400 Servers can access PCI slots 1,2 and 8-12. rp5450/3000 Servers can access all PCI slots.

Follow these procedures to install graphics cards.

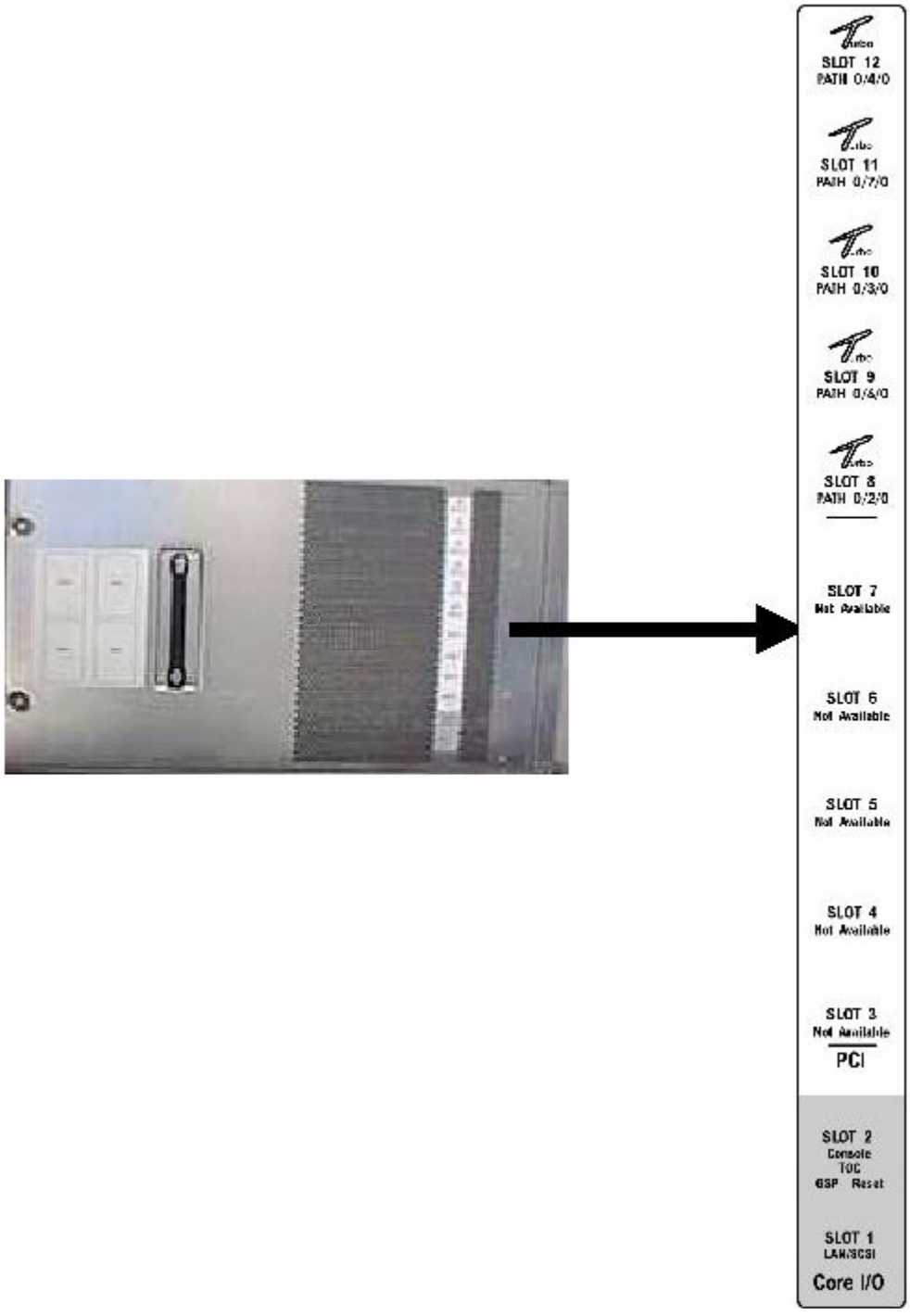
**Step 1.** Install HP-UX 11.0 Support Plus (IPR) 0006, June 2000 or later. This step ensures the appropriate HP-UX drivers are installed.

**Step 2.** Power down and unplug the rp54xx Server.

| | |
|---|---|
| **NOTE** | DC voltages are present when the server is connected to AC power. Do not attempt to install or service: CPUs, memory, PSMs, the platform monitor or PCI I/O cards installed in non-turbo slots (1-6) while DC voltage is present. Failure to observe this warning may result in damage to the server. |

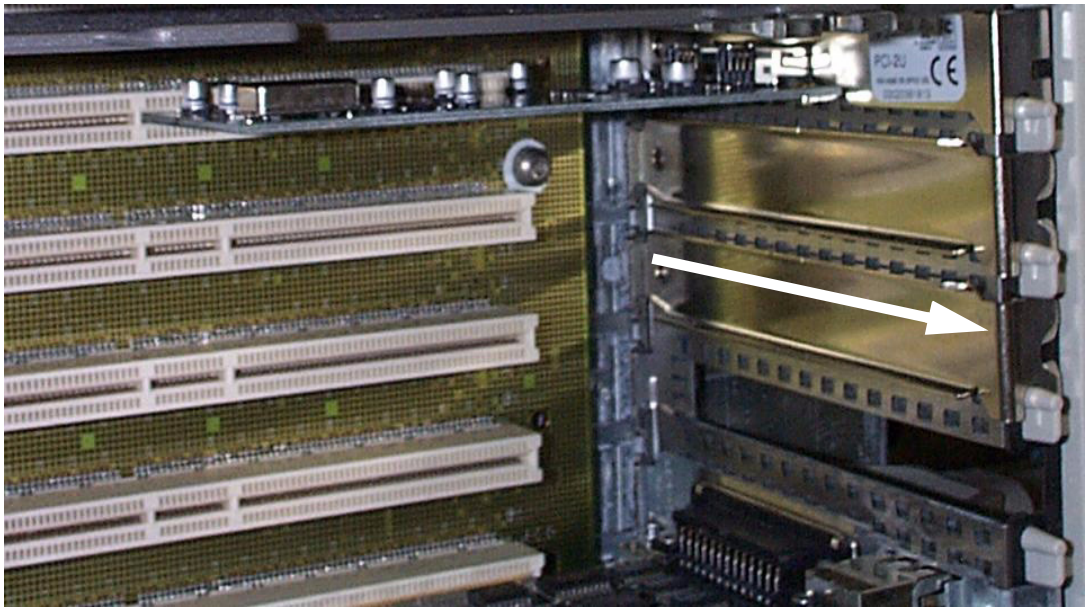
**Step 3.** Make the right side of the server accessible for service.

**Step 4.** Using a torx 15 screwdriver, loosen the captive screws on the right side panel. This panel has a label which shows which PCI I/O slots are available and the corresponding paths. The label shown below is for an rp5400.



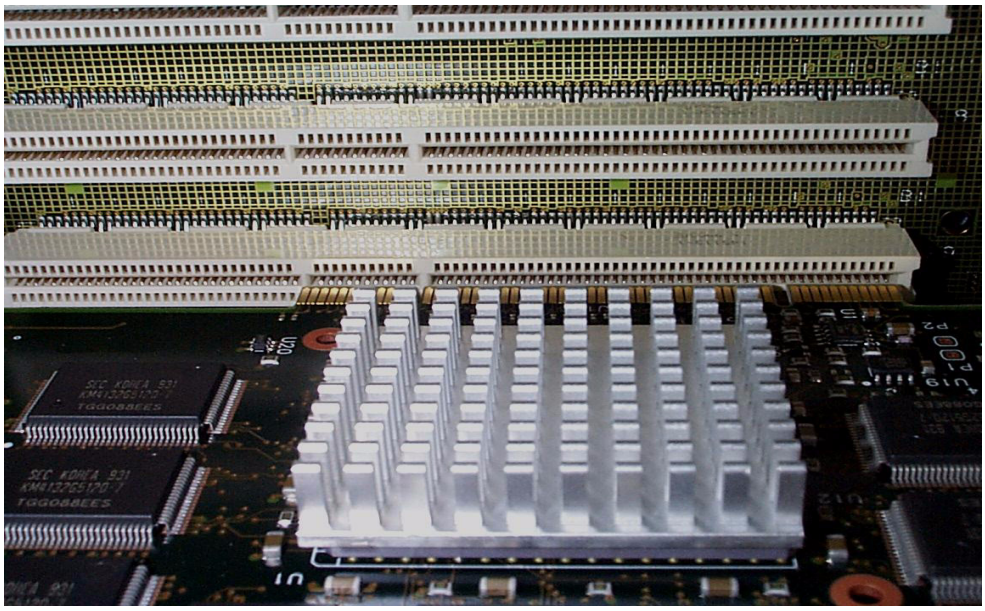

**Step 5.** Grasp the handle on the right rear panel and remove the panel from the side of the chassis. The 12 PCI slots, numbered 1-12 from bottom to top, will be in view.

**Step 6.** Remove the PCI slot cover from the slot that will receive the PCI card. To remove the PCI slot cover, slide the PCI slot cover away from the server.



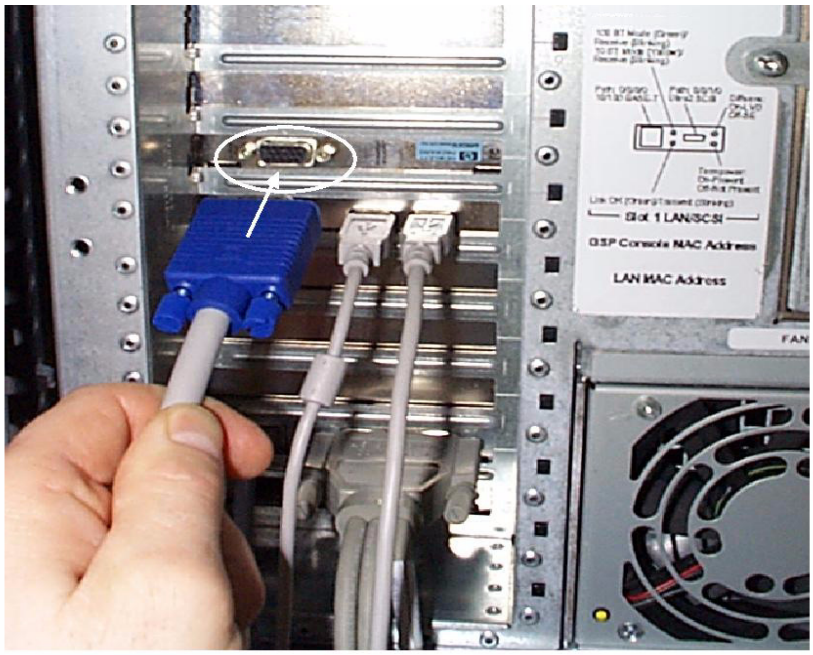
**Step 7.** Center the graphics card within the space created by removing the PCI I/O slot cover. Slide the card toward the edge connectors. Ensure the edge connectors on the card are in alignment with the connectors of the slot. Apply pressure to the card until it snaps firmly in place. Repeat process for USB card.

**NOTE** The graphics card must be installed in any turbo slot while the USB will work in any slot. To reserve turbo slots for high performance I/O cards, install the USB card in a non-turbo slot



**Step 8.** At the rear of the chassis, connect the keyboard and mouse cables to the USB card. It does not matter which connector is used for the keyboard or mouse.

**Step 9.** Connect one end of the 15-pin video cable connector on the graphics card. This connector is labeled “Graphics Display” and “Video Out”. Connect the other end of this cable to the graphics monitor.




**Step 10.** Replace the right side panel and tighten the captive screws.

**Step 11.** For rack configurations, insert the rp54xx Server back into the rack.

**Step 12.** For deskside enclosure configurations, repalce the deskside enclosure cover.

**Step 13.** Power the server on.

**Step 14.** Use the server firmware `in io` command to verify the graphics cards are recognized by the server. If AUTOBOOT is ON, it will be necessary to interrupt the boot process to get to the server firmware `Main Menu: Enter command or menu >` prompt.

**Step 15.** Boot HP-UX and run the `ioscan` utility to verify the system recognizes the new PCI card.

**Step 16.** Logon as root and install X/CDE/Motif if not already installed.

## Graphics Troubleshooting

This section describes how to troubleshoot common problems encountered during installation or attempted use of graphics. The following system utilities can be used to display or set the graphics configuration:

- `/opt/graphics/common/bin/graphinfo` allows you to display the current graphics configuration and the graphics drivers that are being used.
- `/opt/graphics/common/bin/setmon` allows you to reconfigure the monitor type.
- The `display` menu of the HP-UX System Administration Manager (SAM) utility allows you to configure the X-Server and set the monitor type.
- On-line diagnostics provide information, verify and diagnose coverage for the graphics and USB cards.Off-line diagnostics do not exist for either the graphics or USB card.
- The HP-UX `ioscan` utility can be used to verify the HP-UX operating system recognized the hardware.

#### Symptom: CDE will not come up.

**Step 1.** Ensure /dev/crt was created. If not created, use `insf -e` to create.

**Step 2.** Ensure the system is at run level 3. Use `who -r` to determine run level. Use `init 3` to change to run level 3.

**Step 3.** Ensure dt is enabled. Use `/usr/dt/bin/dtconfig -e` to enable dt.

**Step 4.** Ensure /etc/dt/config/Xservers exists. If not, use `/usr/dt/config/dtrc.d/20_graph_conf` to create.

**Step 5.** Ensure the line: * Local local@console /usr/bin/X11/X :0 is not commented out of the /etc/dt/config/Xservers file.

**Step 6.** Reboot HP-UX.

#### Symptom: HP-UX does not recognize the graphics cards. `unknown` appears in the ioscan output for these cards

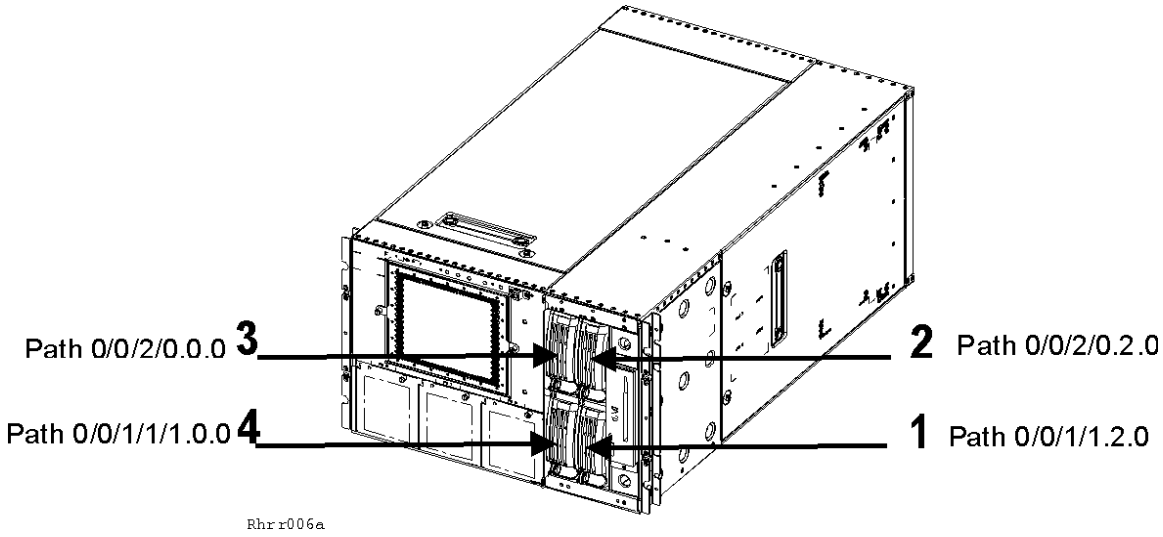
.

**Step 1.** Examine the output of the `swlist` command to ensure the correct version of HP-UX is installed.

**Step 2.** Update HP-UX as necessary.

# Installing Disk Drives

rp54xx Servers support up to four optional internal hard drives. These drives must be installed in the following sequence:

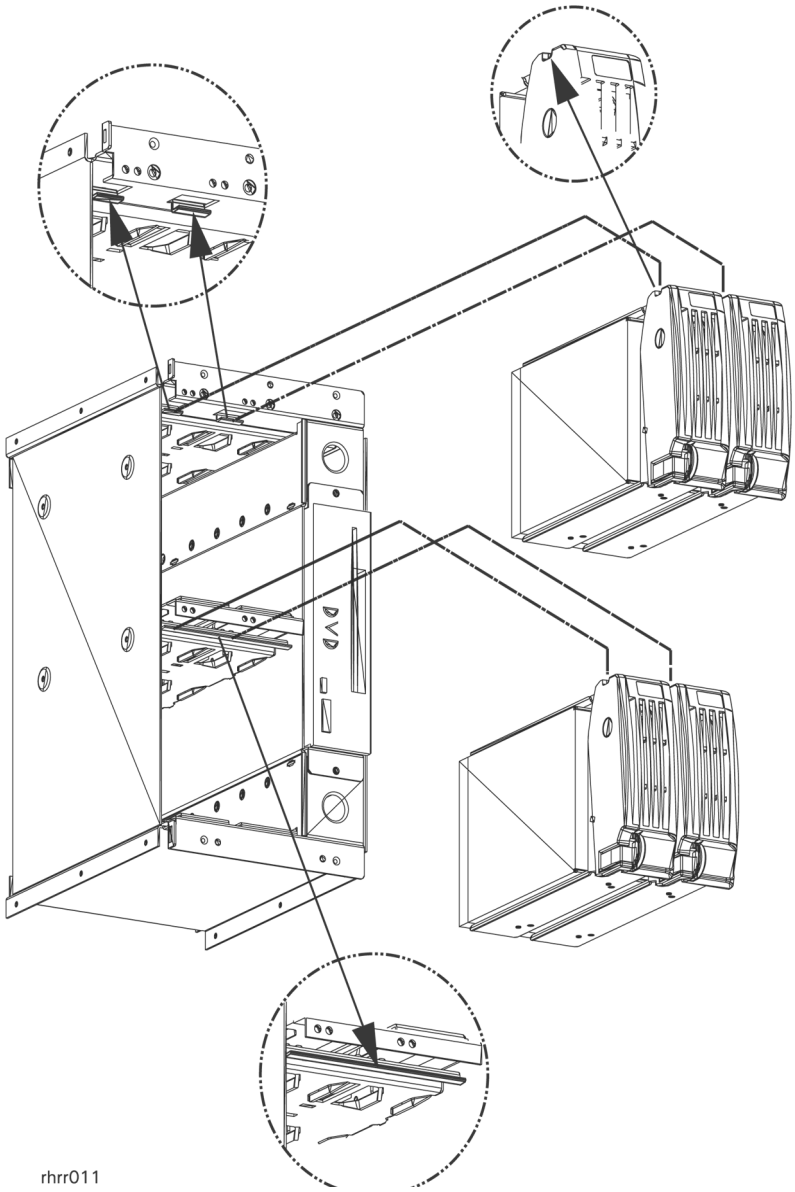



It is not necessary to shutdown the HP-UX operating system or power off the server to install a new disk. Follow this procedure to add internal hard disk drives to your rp54xx Server.

**Step 1.** If a front bezel is installed on the face of the server, open the right-hand panel to gain access to the disk slots.

**Step 2.** Remove the disk drive slot cover.

**Step 3.** Insert the new disk drive into the slot until the rear connectors snap into place in the card guide. As shown in the following graphic, the notches at the top of the disk drives must snap over the small brackets in the disk bay to ensure a firm connection.




**Step 4.** Secure the connection by pushing the blue release lever closed.

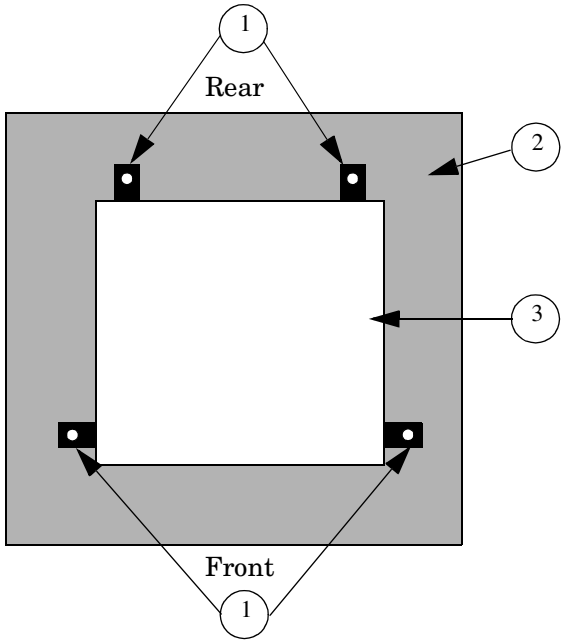
**Step 5.** Refer to HP-UX documentation to configure the new disk.

# 2 Server Unpacking and Installation

# Factory Integrated rp54xx Cabinet Installation

A factory integrated server is one in which the rp54xx Server and associated components are pre-assembled and shipped from the factory already installed in a Hewlett-Packard E-Series cabinet. Factory integrated systems reduce the amount of time required to set-up and begin server operation.

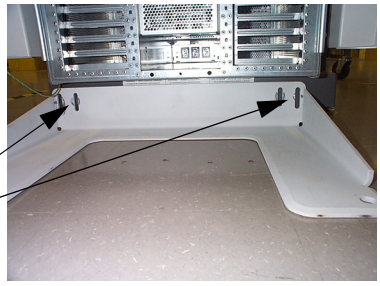
1. Carefully remove the carton and anti-static bag from the pallet.
2. Remove the front two (2) L-brackets. Retain the 1/2-inch bolts for later use.




1. Shipping L-Bracket
2. Shipping Pallet
3. Cabinet (Top View)

**NOTE** As viewed from the front, one bracket is located on each side at the base of the cabinet near the front.

3. At the rear of the cabinet:
   a. Open the door.
   b. Remove the anti-tip foot by removing and retaining the two (2) 1/2-inch bolts.




For Shipping: L-brackets are mounted behind anti-tip foot. Same bolts secure both.

   c. Remove the two (2) L-brackets (revealed by removing the anti-tip foot).
4. Remove the two ramps from the pallet and carefully place them into the slots at the front of the pallet.

---

**WARNING** **Use extreme care when rolling the racked system down the ramps. A rack containing one rp54xx can weigh up to 418 lbs. Do not stand in front of the ramps when rolling the cabinet off the pallet or injury may occur. All but the smallest configurations require two persons to safely remove the rack from the pallet.**

**If anti-tip feet or ballast are not installed or are improperly installed the cabinet can tip. Failure to follow this precaution can cause injury to personnel or damage to equipment.**

---

5. Straighten the rollers on the cabinet base, if needed, and carefully roll it down the ramps.

---

**WARNING** ***After removing the server from the pallet, Do not move the cabinet unless the anti-tip feet are installed!*** **The cabinet can tip if care is not used. Due to their low ground clearance the feet may catch on irregularities on the floor, thresholds, or ramps.**

***Do not move the cabinet without first installing the anti-tip feet.*** **The cabinet may tip if moved without the anti-tip feet or ballast installed.**

***Do not move the cabinet after installing the anti-tip feet unless they are in the fully-raised position.*** **Once installed, the anti-tip feet must be fully raised to allow ground clearance.**

**Because of their low ground clearance, the fully-raised anti-tip feet may need to be removed *temporarily* to clear some obstacles such as door jambs, ramps, and other large irregularities or obstructions on the floor.**

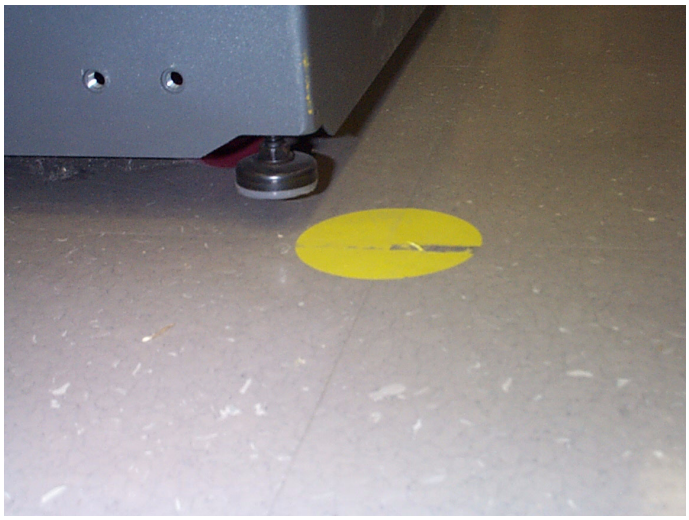
**If you must temporarily remove the anti-tip feet to clear an obstacle, use extreme caution when moving the cabinet. Always reinstall the anti-tip feet as soon as the obstacle has been cleared.**

**Lower and secure both the anti-tip feet and the cabinet leveling/stabilizer feet once the cabinet is in place.**

**Failure to follow these precautions can result in equipment damage or personal injury.**

---

6. Install the front and rear anti-tip feet using the 1/2 inch bolts provided. Ensure that the anti-tip feet are installed in the fully up position in the mounting slots. This will provide maximum ground clearance while moving the cabinet to its final position.
7. Carefully move the cabinet to its installation location.
8. Lower the anti-tip feet to the fully down position and adjust the cabinet leveling feet for best cabinet stability.



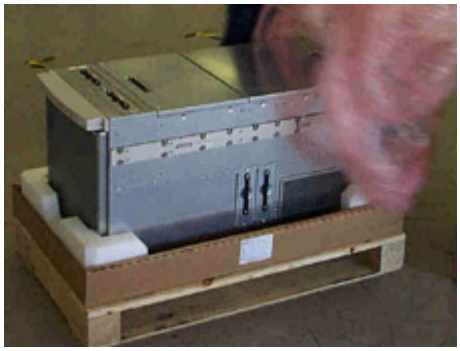
# Receive and Unpack A Non-Integrated Server

**WARNING** **The typical rp54xx system can weigh up to 68kg (150lbs). *HP recommends using an an approved lifting device*. Lift and move the server in accordance with all local safety regulations. Failure to follow this precaution can cause injury to personnel or damage to equipment.**

## Unpacking the server

The following procedure describes the steps involved in unpacking the server, whether to function as a stand-alone Deskside unit, or to be integrated into a cabinet.

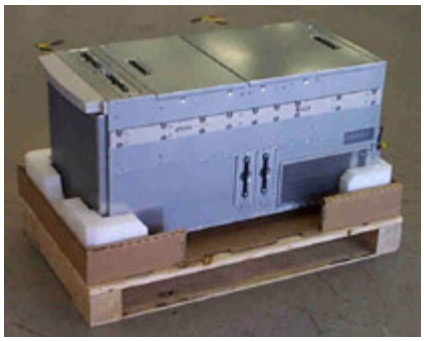
**Step 1.** Remove the shipping carton and anti-static bag from the server as depicted below.



**NOTE** The packaging for rp74xx and rp54xx Servers is the same, rp74xx is shown.

**Step 2.** If you are moving the server manually, use three people to lift the server from the packing material and pallet. Carefully move the server to the selected location.

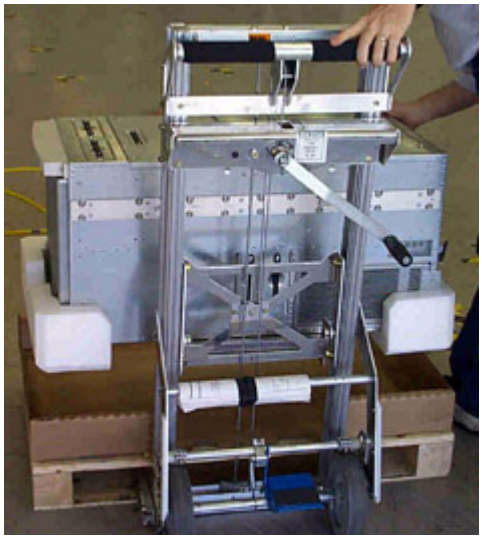
**Step 3.** If you are moving the server by an approved lifting device (such as Genie Lift ™), remove the tear flap from the front lip of the carton bottom to allow access to the server, as illustrated below. Removal of the tear flap will reveal a slot between the bottom of the server and the inside bottom of the cardboard box.



**Step 4.** Carefully raise the lift's platform so that it will slide into the slot located ***under*** the center of the server, but ***over*** the top of the pallet.


**NOTE** The server's center of gravity will vary with the hardware configuration, but it is generally located slightly behind the middle of the server.

**Step 5.** Raise the lifting device platform enough for the server to clear the pallet and packing materials, as show below.



# Install Deskside Server

The following section describes the installation of a server into a Deskside enclosure for installation in an office environment.

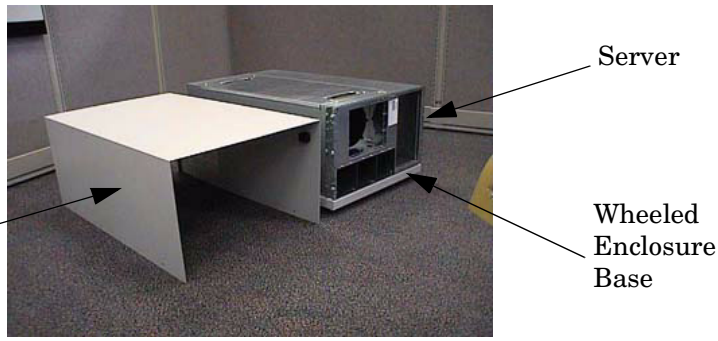
**WARNING** **The typical rp54xx system can weigh up to 68kg (150lbs). *HP recommends using an approved lifting device*.**

- **Lift and move the server in accordance with all local safety regulations.**
- **Do not attempt to lift the server by the plastic handles on the top and side covers.**

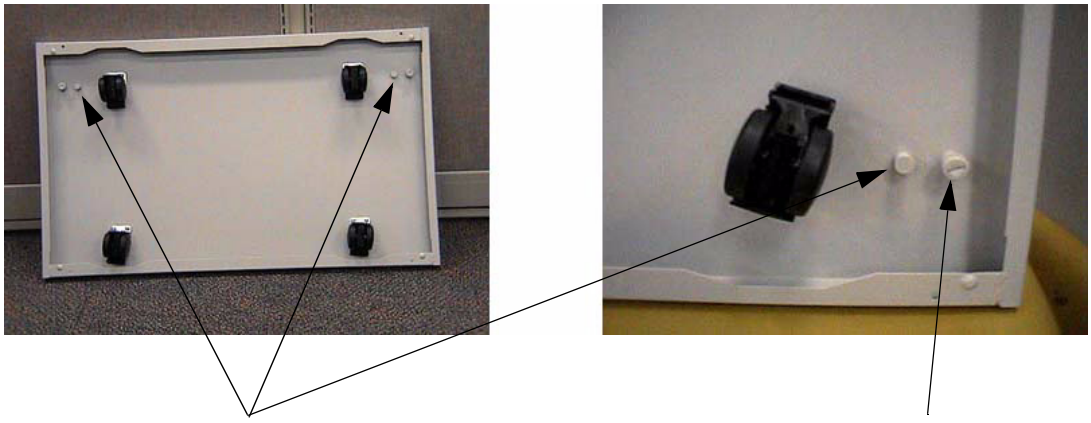
**Failure to follow these precautions can cause injury to personnel or damage to equipment.**

**Step 1.** Unpack the server.

**Step 2.** Unpack the deskside enclosure.



**NOTE** Ensure that the positioning spring pins in the enclosure base align with the alignment holes in the bottom of the server.




**Step 3.** Position the server on the wheeled enclosure base.

**Step 4.** Tighten the two captive screws in the enclosure base to secure the server to the base.

**Step 5.** Position the enclosure cover (outside skin) over the server and install and tighten the screws to secure it to the base.

**NOTE** The perforations and the lip of the outside skin should be toward the rear of the server.

**WARNING** **Stacking rp54xx Servers in deskside enclosures is *not* supported.**

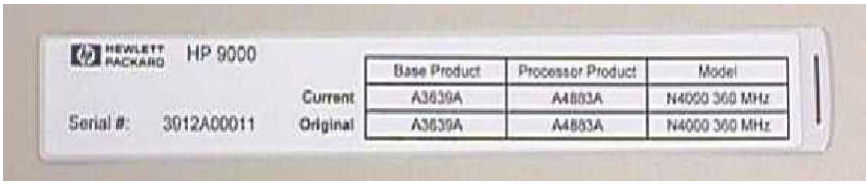
**Stacking rp54xx Servers in deskside enclosures can damage equipment, may cause injury to personnel, and may void your warranty or service contract.**

**Step 6.** Install the Front Bezel.

**Step 7.** Locate the two pull-tabs. One pull-tab is longer than the other. The shorter pull-tab is blank on both sides. The back of the shorter pull-tab provides a writable surface for twin use.

**Step 8.** Locate the plastic bag containing the label sheet (taped to the server).

**Step 9.** Remove the label containing serial number, base product, processor product, and model information from the label sheet and apply to the back of the longer pull-tab.

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**NOTE** Pull-tab and label shown above is for an rp74xx Server. rp54xx uses the same style label and similar pull-tab.

---

**Step 10.** Insert the pull-tabs into the front bezel. Install the longer pull-tab in the left side plastic window in such a way that the rp54xx logo is visible. Install the shorter pull-tab in the right side plastic window with either surface visible. Refer to the diagram above for pull-tab locations.

# Install Stand-Alone Server in a Cabinet

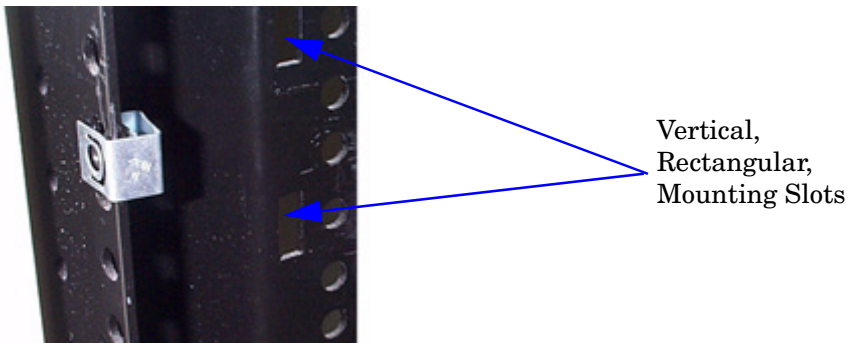
The following describes how to install the A5556A slide-tray assembly into an approved HP cabinet in preparation for installing an rp54xx Server.

This slide-tray assembly can be installed in an HP E-Series cabinet or other HP cabinets approved for rp54xx system installation. To install the A5556A slide-tray assembly in an approved HP equipment cabinet, proceed as follows:

**Step 1.** Determine what type of cabinet you are installing the slide-tray assembly into.

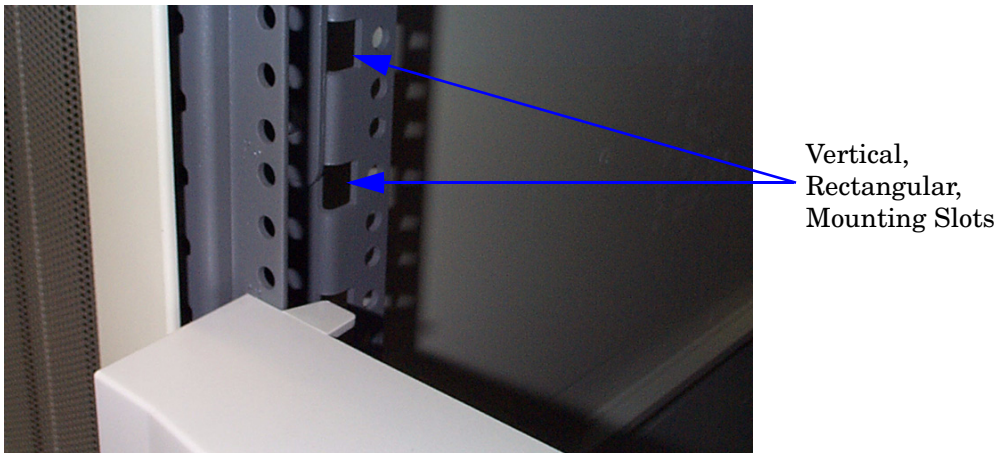
**a.** E-Series cabinets have:

- Parchment white, plastic, sectional, side panels
- Black painted vertical frame posts with a partial return flange



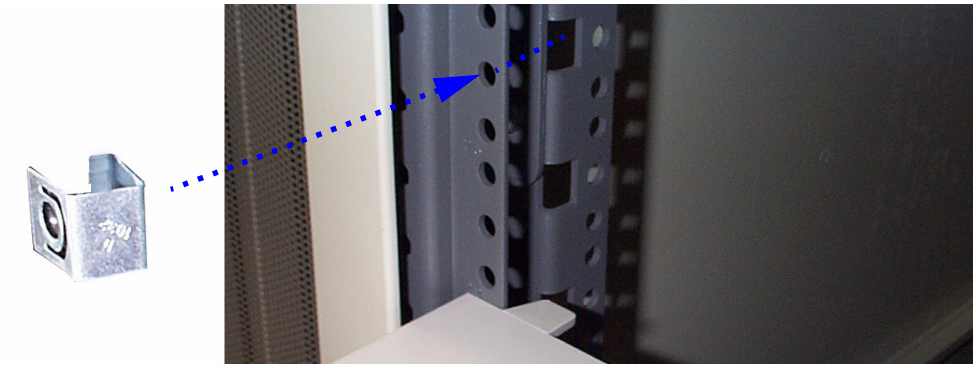

**b.** Approved, non-E-Series, cabinets have:

- Single piece metal side panels
- Gray painted vertical frame posts with full return flanges



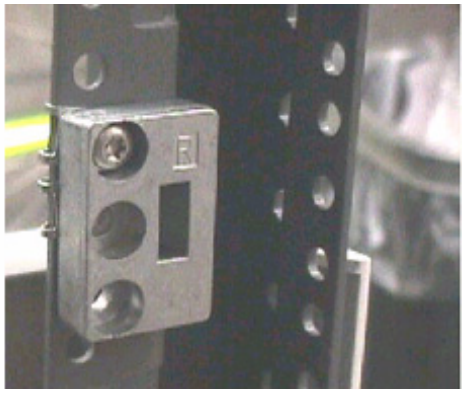

**Step 2.** Note the vertical, rectangular, slots in the return flanges on the vertical mounting posts. Determine into which of these vertical slots the slide/tray kit will be installed. This is done by counting down eight rectangular slots from the top of the cabinet or the bottom of the equipment above.

**Step 3.** On the front vertical mounting posts *only*, slide M5 sheet metal nuts onto the posts over the holes immediately adjacent to the vertical slots determined in the previous step. Also place M5 sheet metal nuts on the holes directly above these. Orient the sheet metal nuts so that the threaded portion faces towards the outside of the cabinet. There should now be a total of four (4) sheet metal nuts installed.



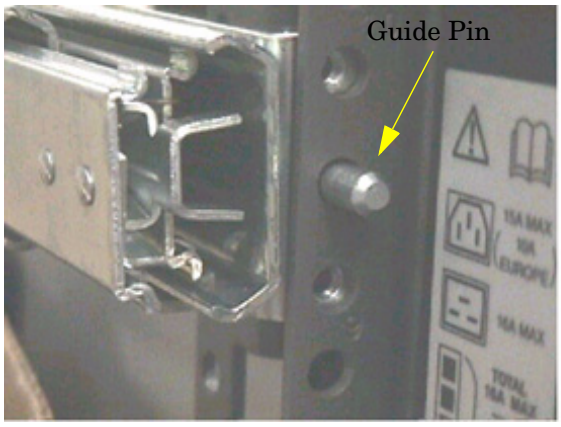
**Step 4.** If the cabinet is a non-E-Series cabinet, discard the left hand and right hand aluminum spacers and two of the M5 x 16 screws with cress-cup washers and proceed to step 12.

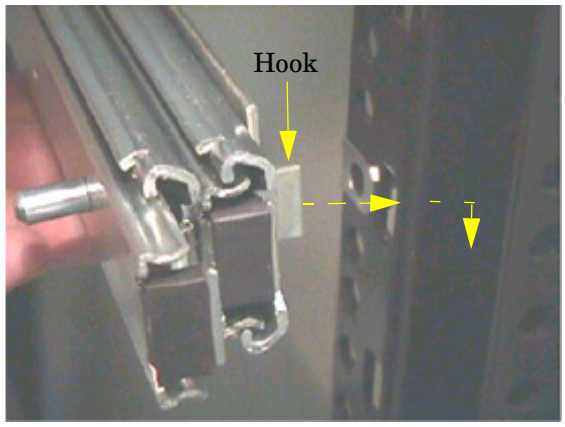
**Step 5.** If the cabinet is an E-Series cabinet, place the hook of the aluminum spacer marked “L” (5183-1864) into the appropriate vertical, rectangular slot on the front, left hand mounting post. The hook points downward. Similarly, place the spacer marked “R” (5183-1863) into the appropriate slot on the right hand mounting post.



**Step 6.** Use one M5 x 16 screw with cress-cup washer to attach each spacer to its vertical post. Do this by inserting the screw through the top hole in the spacer, through the mounting rail and tightening it into the sheet metal nut located at that position.

**Step 7.** Take the left hand slide/bracket assembly (marked 337079-1L) and install it into the left hand vertical mounting posts. This is done by inserting the pin at the rear of the slide's mounting bracket into the 23rd hole in the rear vertical mounting post and inserting the hook at the front of the bracket into the vertical, rectangular slot in the aluminum spacer. The slide should be positioned in the cabinet so that it is horizontal and level.



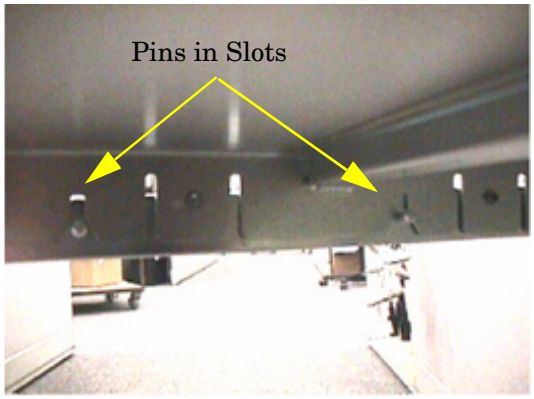

**Step 8.** Securely fasten the rear of the slide's mounting bracket to the rear vertical mounting post by installing and tightening two of the M5 x 16 screws with cress-cup washers thorough the mounting post, through the slides mounting bracket and into the threaded nuts attached to the mounting bracket.

**Step 9.** Fully extend the slide so that it is locked in the fully open position.

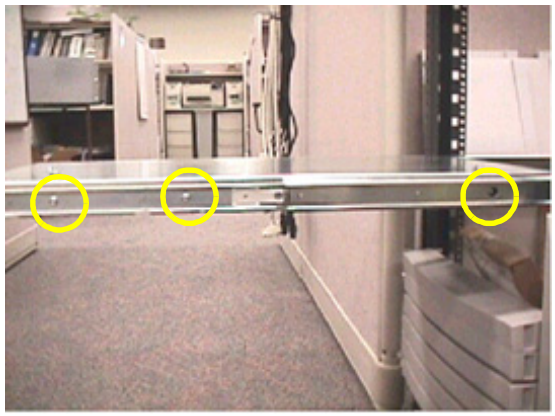
**Step 10.** Use an M5 x 30 screw with a cress cup washer to attach the front of the slide to the vertical mounting post. Insert the screw through the slide, through the center hole of the aluminum spacer, through the vertical mounting post, and tighten into the sheet metal nut located at that position.

**Step 11.** Use a procedure similar to steps 7 through 10 to install the right hand slide/bracket assembly (marked 337079-1R) and then proceed to step 12.

**Step 12.** Take the tray and place it onto the pins that extend from the slides' inner members. The slots with wide lead-in guides on the side of the tray fit down onto the slides' pins. The flat part of the tray will be on top, and the mounting holes in the top of the tray will be located to the right of the center of the tray. Slide the tray all the way down on both sides so that the pins reach the top of the slots in the side of the tray.



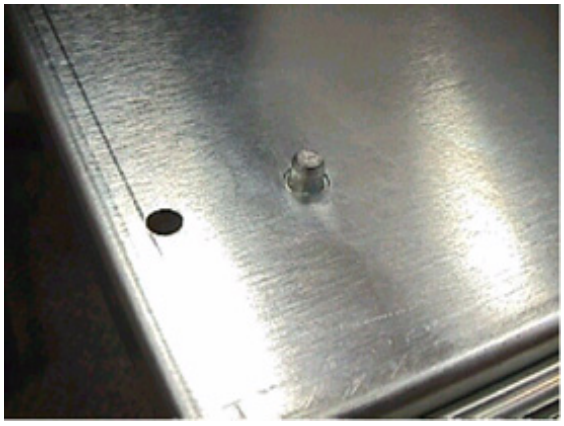
**Step 13.** Use six, M5 x 12 screws (without washers) to attach the tray to the slides. Three screws are used to attach each slide. Insert the screws through the slides, through the tray and tighten into the threaded nuts located on the inside of the sides of the tray.



3 Pan Head
M5x12 T25 screws
on each side

**Step 14.** From the bottom of the tray pull the plunger pin down and give it a 1/4 turn to hold it in place.

**Step 15.** Position the server on the tray aligning the plunger pins with the alignment holes in the chassis.



**Step 16.** Release the plunger pins to secure the server.

# Stationary L-Bracket Rail Assembly

rp54xx Servers may be installed into E-Series and approved Non- E-Series cabinets using stationary L-bracket rail assembly kits listed below.

**NOTE** rp54xx Servers are supported in Hewlett-Packard E-series and approved Non- E-series Hewlett-Packard cabinets, and approved rail kits.

For information on additional qualified 3rd party cabinets and rail kits, contact the nearest Hewlett-Packard Response Center.

| Cabinet Type | Rail Kit Product Number |
|---|---|
| E-Series HP Cabinet | A5575A |
| Other Approved HP Cabinet | A5562A |

## Identifying Approved Non-E-Series HP Cabinets

Approved Non- E-Series cabinets have black frames, one piece outside sheet metal skins, a partial return flange, and *requires* the installation of the aluminum spacer blocks, supplied with the rail kits.

Approved Non- E-Series cabinets include the following product numbers: A1883A, A1884A, A1896A, A1897A, C1897A, C2785A, C2786A, and C2787A.

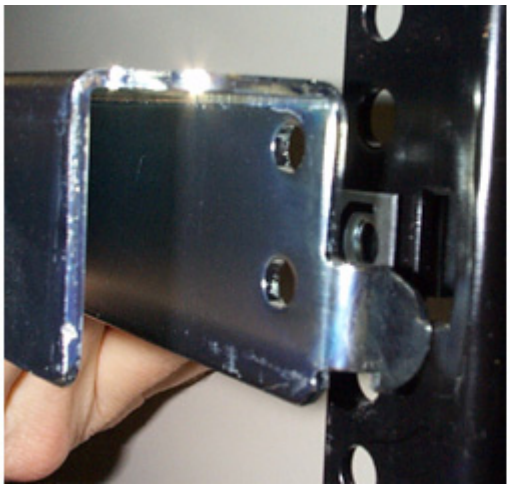
## Identifying E-Series HP Cabinets

E-Series cabinets have light gray frames, sectioned, plastic outside “skins”, a full return flange, and does *not* require the installation of the aluminum spacer block supplied, with the rail kits.

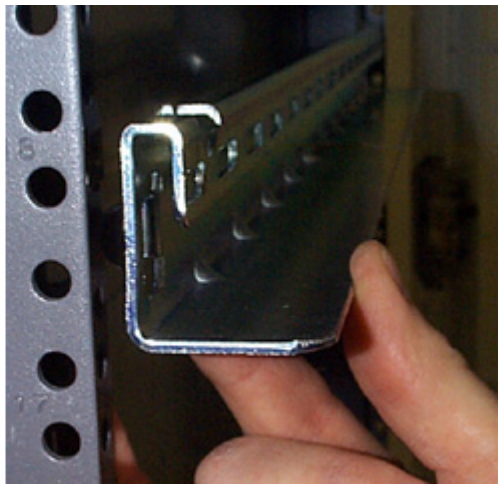
E-Series cabinets include the following product numbers: A5134A, A5136A, A5136A, A4900A, A4901A, A4902A, J1500A, J1502A, and J1502A.

## Identifying Static Rail Kit

Hewlett-Packard has currently approved two static rail kits for use in cabinet mounting the rp54xx Server. They are illustrated below.



A5562A Kit Rail



A5575A Kit Rail

## Installing Stationary Rails

The installation of stationary rails is similar for most cabinet and rail combinations. The key considerations to are:

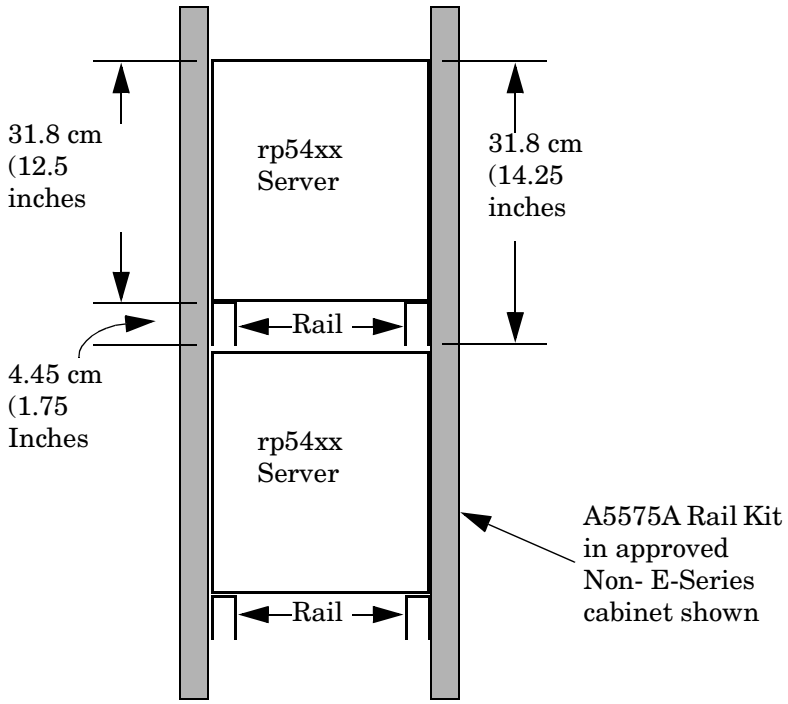
- Ensure that all safety precautions are read, understood, and observed
- Follow all installation instructions provided with the cabinet and rail kits, and

- Ensure that the rails extend out from the cabinet posts sufficiently to properly and safely support the equipment being installed.

To install an rp54xx Server on stationary rails in an approved cabinet proceed as follows:

**Step 1.** Locate the rail mounting height in the cabinet. Allow for the following space requirements:

- For each rp54xx Server, allow 31.8cm (12.5 inches) vertically (7 EIAs or Rack Units (RUs).
- If installing the A5575A rail kit, allow an *additional* vertical 4.45cm (1.75 inches (1 EIA) each set of rails.




**Step 2.** Install sheet metal nut(s) in the vertical cabinet posts at the required height for the kit being installed:

- Install the first nut either:
  - — 4.45 cm (1.75 Inches) above the top, or
  - — 31.8 cm (12.5 inches) below the bottom of the last server.
- If installing a A5562A rail kit, install the second nut in the next frame hole below the first.

**Step 3.** Hold the rail in place and insert and tighten the screws.

For installation of other qualified cabinet and rail combinations refer to the safety precautions and instructions accompanying them.

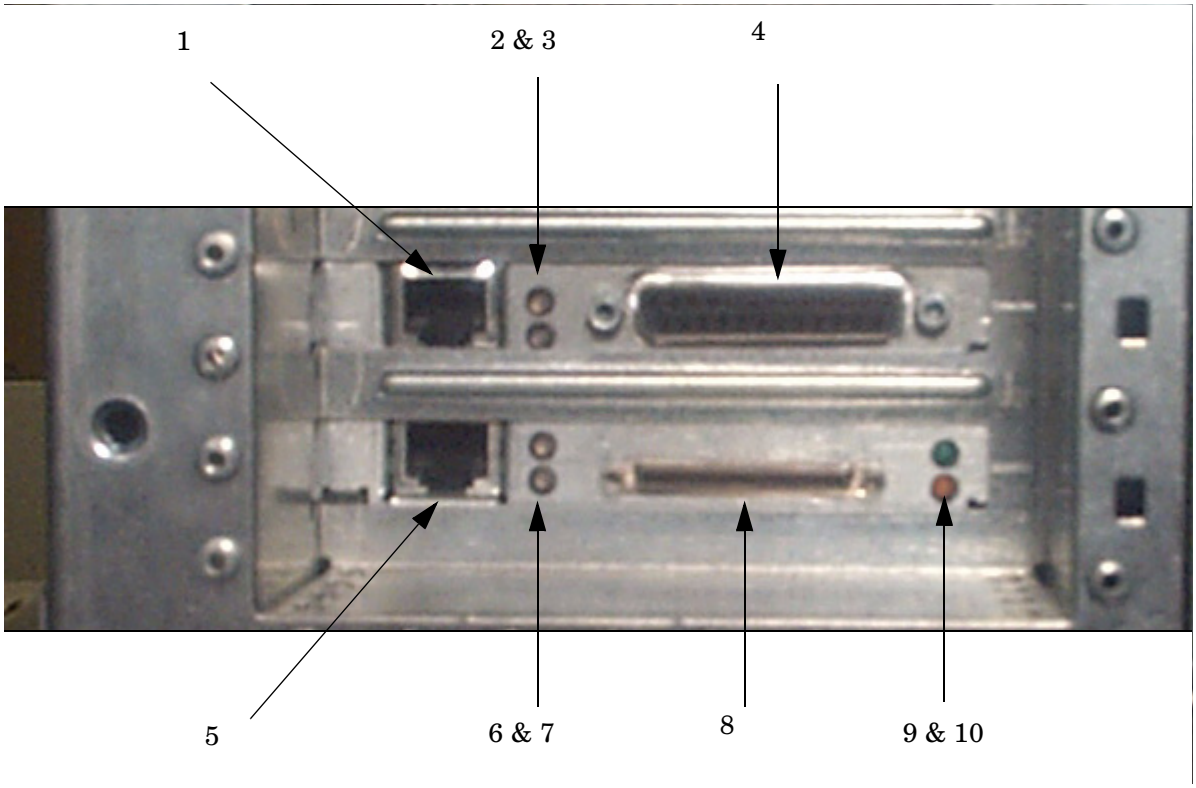
# 3 Cabling and Power-Up

# Core I/O Connections

The following paragraphs describe the indicators and connections of the rp54xx Core I/O. Core I/O consists of a LAN/SCSI card in slot 1 (lower slot in graphic) and a Guardian Service Processor (GSP) in slot 2 (upper slot in graphic). There are two versions of GSP, revision A and revision B.

## Revision A GSP

The following graphic shows the indicators and connectors for the revision A GSP and LAN/SCSI Core I/O boards.




1. 10-Base-T LAN (RJ-45) Connector

   GSP LAN.

2. Green/Red (Upper LED)

   Green = GSP Power On.

   Flashing Green = LAN Receive.

   Red = Guardian Support Processor Test Failed.

3. Green/Red, (Lower LED)

   Green = Link OK.

   Flashing Green = LAN Transmit.

   Red = Guardian Support Processor Test Failed.

4. Console/UPS/Remote Connector (D-Type 25-Pin female).

*Requires an A5191-63001 “W” adapter cable*

5. 10/100 Base-T = Primary LAN (RJ-45) Connection

   *Path 0/0/0/0*

6. Green/Yellow (Upper LED)

   Green = 100 Base-T Mode

   Green Blinking = 100 Base-T Receiving

   Amber = 10 Base-T Mode

   Amber Blinking = 10 Base-T Receiving

7. Green (Lower LED)

   Green = Link OK (10/100 Base-T Mode indicated by LED #6)

   Green Blinking = Transmitting

8. Ultra-2 SCSI Connector (68-Pin VHDCI SCSI)

   *Path 0/0/1/0*

9. SCSI Mode (Green, Upper LED)

   On = Low Voltage Differential (LVD) Mode.

   Off = Single Ended Mode.

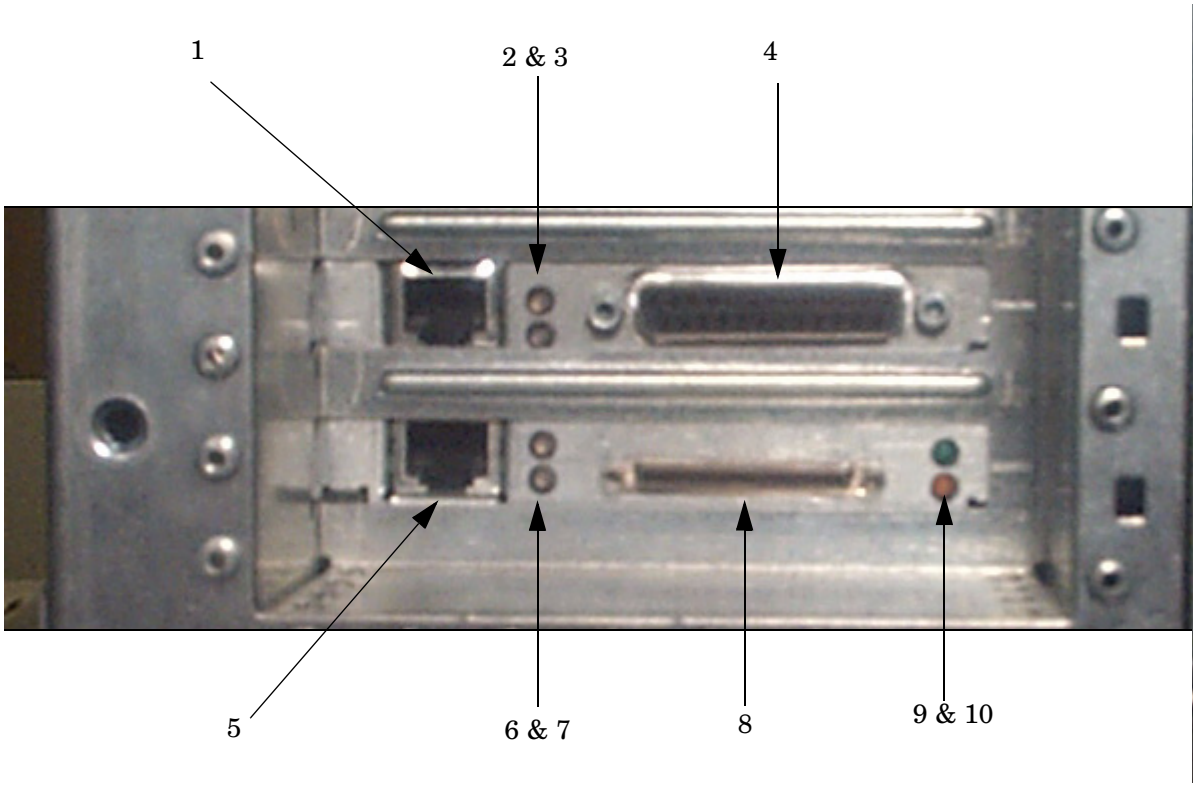
10. SCSI Terminator Power (Amber, Lower LED)

    On = Terminator power present

    Off = Terminator power Not present.

## Revision B GSP

The following graphic shows the indicators and connectors for the revision B GSP and LAN/SCSI Core I/O boards.




1. 10/100-Base-T LAN (RJ-45) Connector.

   GSP LAN.

2. Green/Red (Upper LED).

   Green = GSP Power On.

   Red = Guardian Support Processor Test Failed.

3. Green/Yellow, (Lower LED).

   Green = 100 Base-T Link OK.

   Flashing Green = 100 Base-T LAN Activity.

   Yellow = 10 Base-T Link OK.

   Flashing Yellow = 10 Base -T LAN Activity.

4. Console/UPS/Remote Connector (D-Type 25-Pin female).

   *Requires an A6144-63001 "M" adapter cable.*

5. 10/100 Base-T = Primary LAN (RJ-45) Connection.

   *Path 0/0/0/0.*

6. Green/Yellow (Upper LED).

   Green = 100 Base-T Mode.

Green Blinking = 100 Base-T Receiving.

Amber = 10 Base-T Mode.

Amber Blinking = 10 Base-T Receiving.

7. Green (Lower LED).

   Green = Link OK (10/100 Base-T Mode indicated by LED #6).

   Green Blinking = Transmitting.

8. Ultra-2 SCSI Connector (68-Pin VHDCI SCSI).

   *Path 0/0/1/0*.

9. SCSI Mode (Green, Upper LED)

   On = Low Voltage Differential (LVD) Mode.

   Off = Single Ended Mode.

10. SCSI Terminator Power (Amber, Lower LED)

    On = Terminator power present

    Off = Terminator power Not present.

# Guardian Service Processor (GSP) Overview

This section provides an overview of the Guardian Service Processor (GSP). The GSP is an always on, dedicated service processor that monitors system power, cooling and configuration, and provides console communications. Power and cooling information is obtained via an interface to the platform monitor card. Configuration information is obtained via connection to the Serial Presence Detect (SPD) bus. The GSP can only be installed in slot 2 and must be present for the server to power up.

The GSP has downloadable firmware which can be updated independent of the HP-UX operating system. GSP firmware updates can occur anytime the GSP is active. If the DC power switch is OFF, the GSP is still operational and GSP firmware updates can still occur. GSP firmware updates may be performed by customers.

If the GSP becomes hung, it is possible to reset the GSP without impacting the server. The GSP may be reset via the GSP RESET button on the right side of the card. The PCI cover panel (right side panel) must first be removed to allow access to the right side if the GSP card.

The GSP has two connectors on the bulkhead. An RJ-45 for LAN connections and a female DB25 connector for RS-232 connections. Attach either a “W” or an “M” cable to the DB25 connector to provide individual output for CONSOLE, REMOTE and UPS.

To access the GSP from the local ASCII console, type control b and the `GSP>` prompt will appear. It may be necessary to type control Ecf first. To exit the GSP, type `GSP>co`.

The GSP was originally a core component of the revision A rp5400 (A5576A) and rp5450 (A5191A) servers. Beginning with introduction of the revision B rp5400 (A5576B), rp5450 (A5191B), and rp5470 Servers the GSP became a separate, must order product (A6696A).

There are two revisions of rp54xx GSP: rev A (A6696A) and rev B (A6696B). Both GSPs must be installed in order for the server to power up.

## GSP LAN

This LAN is exclusively for LAN console access and is not configurable via HP-UX. The LAN is configured via GSP commands. Hostname, IP, gateway and subnet mask parameters may be set via the `GSP>lc` command. The GSP may also initiate ping via the `GSP>xd` command.

## GSP RS-232

The DB25 connector on the GSP is used for RS-232 communications to a local console (via CONSOLE connector), a remote console via modem (REMOTE connector), and a UPS (UPS connector). The baud rate, term type, etc., of the CONSOLE and REMOTE ports are configured via `GSP>ca` command.

The GSP supports VT100 and HPTERM terminal emulation. For correct communications, the GSP and RS-232 device must use the same terminal emulation and baud rates.

## GSP Features

The revision A GSP provides a 10 base-T LAN connector for LAN console access and a DB-25 connector to which the A5191-63001 W-cable connects. The W-cable provides REMOTE, UPS, and CONSOLE DB-9 connectors.

Features of the revision A GSP are:

- 10 Base-T LAN connector for revision A GSP

- 10/100 Base-T LAN connector for revision B GSP
- On-board processor dedicated to GSP functions
- Error logging and notification
- Display of system alerts and selftest chassis codes
- Powered by 15 VDC housekeeping power that is present when the front panel switch is off
- Power and configuration monitoring
- RS-232, LAN, REMOTE and WEB console access
- Administrator and user security
- Alphanumeric paging.

There are two revisions of rp54xx GSP: revision A (A6696A) and revision B (A6696B). Due to significant hardware differences between the revision A and B GSP, each GSP requires it's own firmware. Revision A GSP firmware can only be installed in a revision A GSP and revision B GSP firmware can only be installed in a revision B GSP. The hardware differences are necessary to incorporate the embedded web access, 10/100 Base-t LAN, and faster GSP processor.

The GSP provides four types of console access: RS-232, Remote, LAN and Web. Console information is mirrored to all four console types. Refer to *Configure System Consoles* for more information.

The GSP was originally a core component of the revision A rp5400 (A5576A) and rp5450 (A5191A) servers. Beginning with introduction of the revision B rp5400 (A5576B), rp5450 (A5191B), and rp5470 Servers the GSP became a separate, must order product (A6696A).

## Revision A GSP

The revision A GSP is identified by product number A6696A and part numbers: A5191-60012, A5191-69012, and A5191-69112.

The revision A GSP requires a "W" cable to be attached to the DB25 connector. The part number of the "W" is A5191-63001. The "W" cable provides female DB9 connectors for CONSOLE, REMOTE and UPS. The maximum supported baud rate for the CONSOLE and REMOTE connectors is 19200 baud and 1200 baud for the UPS.

The paths for the CONSOLE, UPS, and REMOTE are 0/0/4/0.0, 0/0/4/0.1, and 0/0/4/0.2 respectively.

For the rev A GSP, the web console is accomplished by shipping one J3591A Secure Web Console with each rp54xx Server. The Secure Web Console can be used in place of an ASCII console to provide console access via a web connection. If you are installing an rp54xx Server that does not have an ASCII console, you may use the Secure Web Console as the console. However, you must first configure the Secure Web Console. Refer to *Secure Web Console Installation* for more information on SWC Installation/Configuration.

## Revision B GSP

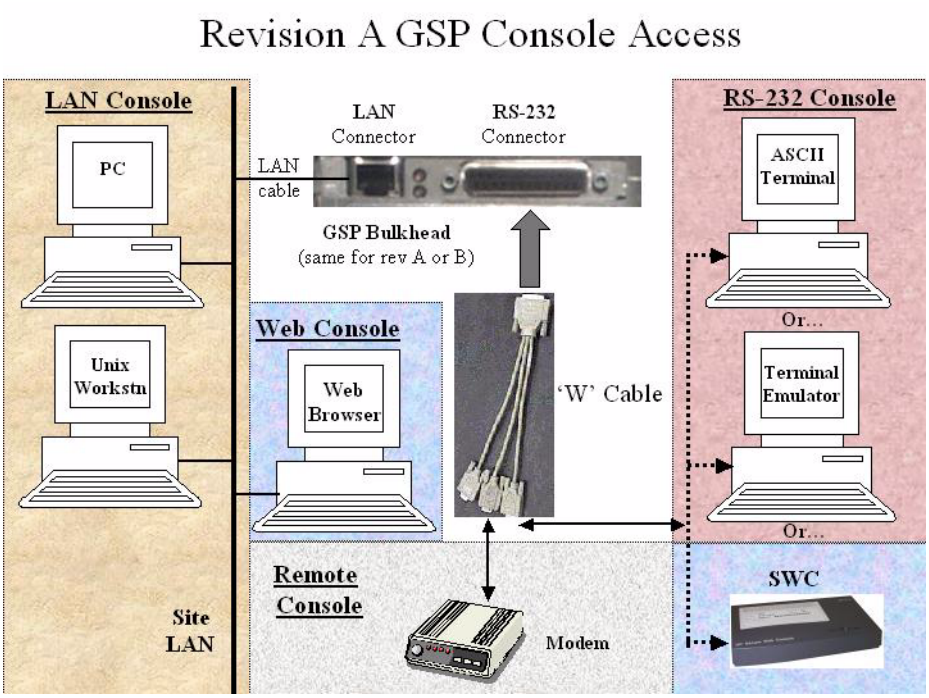
The revision B GSP is identified by product number A6696B and part numbers: A6144-60012, A6144-69012, and A6144-69112.

The revision B GSP requires an "M" cable to be attached to the DB25 connector. The part number of the "M" cable is A6144-63001. The "M" cable provides female DB9 connectors for CONSOLE, REMOTE, and UPS. The maximum supported baud rate for the CONSOLE and REMOTE connectors is 38400 baud and 1200 baud for the UPS.

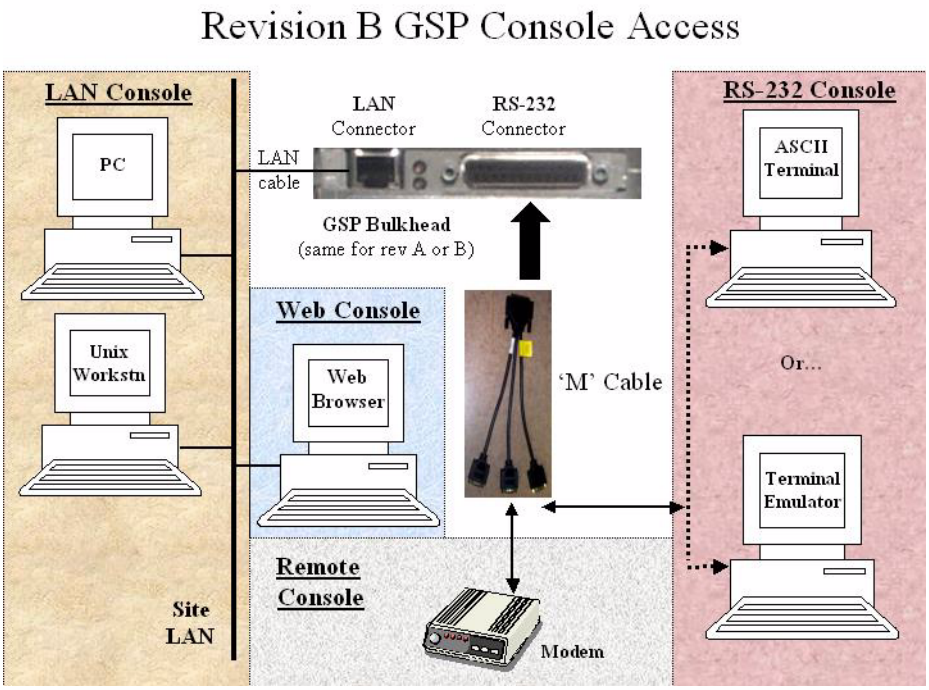
The paths for the CONSOLE, UPS, and REMOTE are 0/0/4/1.0, 0/0/4/1.1 and 0/0/4/1.2 respectively.

# Configure System Consoles

rp54xx Servers provide RS-232, REMOTE, LAN and WEB console access. All console access involves the Guardian Service Processor (GSP). rp54xx Servers use either a revision A or revision B GSP. Below is an illustration of the console access provided by the revision A GSP.



The revision B GSP has embedded web access, eliminating the need for an external Secure Web Console (SWC). Below is an illustration of the console access provided by the revision A GSP.




## GSP Cables

Both the revision A and B GSPs provide a DB-25 connector for RS-232 communications. Connect the A5191-63001 W- cable to the revision A GSP DB25 connector or connect the A6144-63001 M-cable to the revision B GSP DB25 connector. These cables provide individual DB9 connectors for REMOTE, UPS and CONSOLE.

---

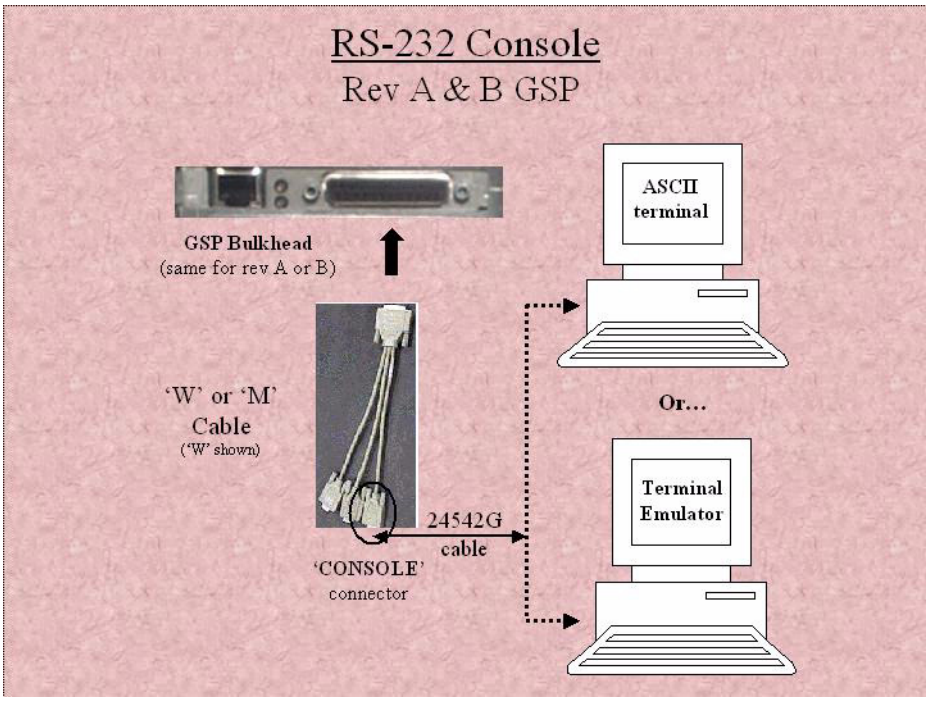
**NOTE** Use the A5191-63001 W-cable with revision A GSP and A6144-63001 M-cable with revision B GSP *only*. Failure to use the right cable can result in reduced functionality.

---

The W and M-cables are slightly different. The W-cable has full RS-232 capability on the REMOTE and CONSOLE connectors and partial RS-232 capability on the UPS connector. The M-cable has full RS-232 capability on the REMOTE and UPS connectors and partial RS-232 capability on the CONSOLE connector. The cable change is to be consistent with rp54xx functionality. The cables are different colors to easily tell them apart. The W-cable is gray and has part number A5191-63001. The M-cable is black and has part number A6144-63001.

## Configure RS-232 Console

The physical connections for an RS-232 console include attaching the correct cable to the GSP. Next, connect the 24542G cable (supplied) to the CONSOLE connector and the serial port of the ASCII console. A personal computer (PC) running terminal emulation software may be used in place of an ASCII console. Refer to the illustration below for RS-232 console.




**Step 1.** The GSP is located in slot 2 of the rp54xx' rear card cage. Connect the 25-pin end of:

- the A5191-63001 W-cable to the 25-pin connector on the revision A GSP card (A5191-60012) OR
- the A6144-63001 M-cable to the 25-pin connector on the revision B GSP card (A6144-60012)

**Step 2.** Connect the 9-pin "Console" connector of either the W or M-cable to the 9-pin D-type connector of a 24542G RS-232 cable.

**Step 3.** Connect the 25-pin end of the 24542G serial cable to the serial/RS232 port on the ASCII console. (RS232 Serial Port labeling may vary depending on manufacturer.)

**Step 4.** Connect the System Console to input AC power.

**Step 5.** Turn the System Console AC power switch to ON.

After the physical connections have been made, configure the ASCII console. When using the C1099A Terminal Console, the default settings are recommended. Refer to the C1099A Terminal Console operating manual for instructions on how to obtain default settings.

The HP 700 series console may also be used as an ASCII console. Both the C1099A Terminal Console and S700 consoles support HPterm and VT100 emulations. The emulation of the GSP and ASCII console need not match for communications between them to occur. However, to ensure proper communications, HP recommends the ASCII console and GSP use the same emulation. HP also recommends that other configurable parameters on the GSP match those of the ASCII console. Baud rate, start/stop bits, etc... The default emulation of the GSP is VT100.

Below is a procedure to configure a HP 700 serial console for VT100 emulation.

### HP 700 Series System Console Configuration

The following describes the steps required to configure the HP 700 series terminal for VT-100 mode for operation with an rp54xx Server.

Although any terminal capable of operating in VT-100 mode can be used, the HP700 series terminal is used here as an example because it is fairly common and it's configuration is typical of many terminals currently in use.

### HP700 VT-100 Mode Configuration

The following procedure outlines the steps to configure the HP700 series terminal for VT100 operation.

---

**NOTE** You may use either the arrow keys or the tab key to move between the setting options on the screen.

---

1. Press **config keys** function key. **f8**
2. Press **terminal config** function key. **f5**
3. Move to *Terminal ID* and enter "vt100".
4. Move to *Set TermMode* and, using the **Prev** and **Next** keys, select "EM100".
5. Press the **config keys** function key**. f8**
6. Press the **ansi config** function key**. f6**
7. Move to "multipage" and, using the **Prev** and **Next** keys, select "yes".

   (Enables screen scrolling).
8. Move to *Backspace Del* and, using the **Prev** and **Next** keys, select "Backspace/Del".
9. Move to *EM100 ID* and, using the **Prev** and **Next** keys, select "EM100".

### Configure the Asynchronous Values of the GSP

After the ASCII console has been configured and physical connections made, make any necessary changes to the asynchronous values of the GSP.

1. Access the GSP with the ctrl+b entry. The GSP will respond with a `GSP>` prompt.
2. At the GSP prompt, enter the Configure Asynchronous (ca) command:

   The ca command will start a series of prompts. Respond to each prompt with the appropriate information.

**Example 3-1 CA command**

```
Leaving Console Mode - you may lose write access. When Console Mode returns, type ^E
cf to get console write access.

GSP Host Name:  fesrhapgsp

GSP> ca

CA This command allows you to modify the local and remote modem serial portconfigura
tions.

Current configuration settings:
```

```
Local Console Serial Port bit rate: 9600 bits/s

Local Console Serial Port Flow Control: Software

Local Console Serial Port Terminal Type: vt100

Remote Console Serial Port Modem Protocol: CCITT  Remote Console Serial Port Modem

bit rate: 19200 bits/s

Remote Console Serial Port Modem Flow Control: Software

Remote Console Serial Port Modem Transmit Configuration Strings: Enabled

Remote Console Serial Port Modem Presence: always connected

Do you want to modify the Local Console Serial Port settings? (Y/N)

Do you want to modify the Remote Console Serial Port Modem settings? (Y/N)

GSP Host Name:  fesrhapgsp
```

If necessary, use the GSP help facility by typing `GSP>he`. Once in the help facility, type the command need help with. Use LI for a list of commands.

The following baud rates are recommended for the revision A GSP:

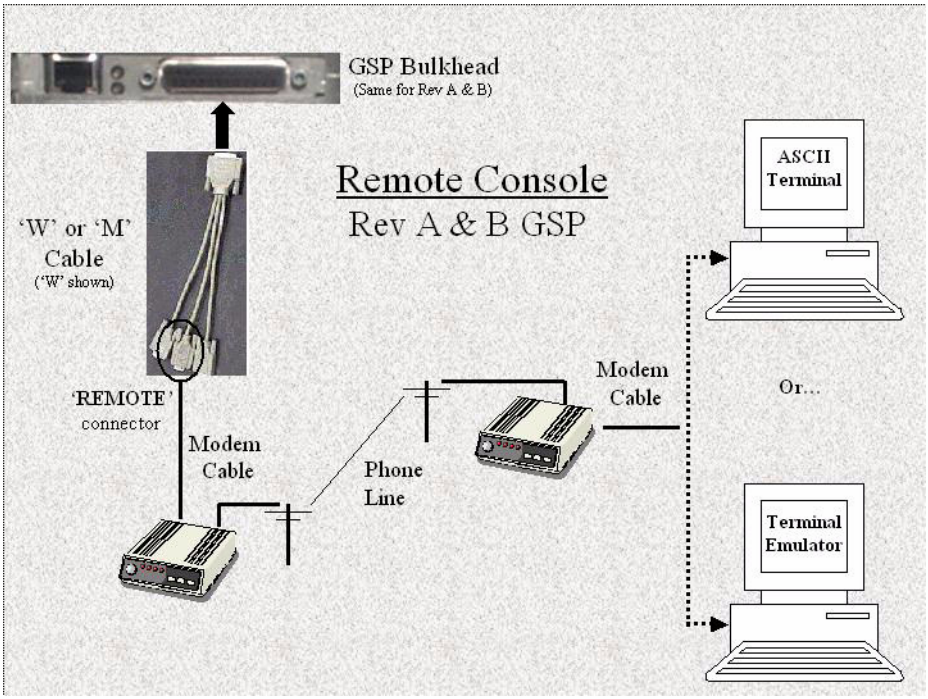
- Console: 19200
- Remote: 19200
- UPS: 1200

The following baud rates are recommended for the revision B GSP:

- Console: 38400
- Remote: 38400
- UPS: 1200

## Configure Remote Console

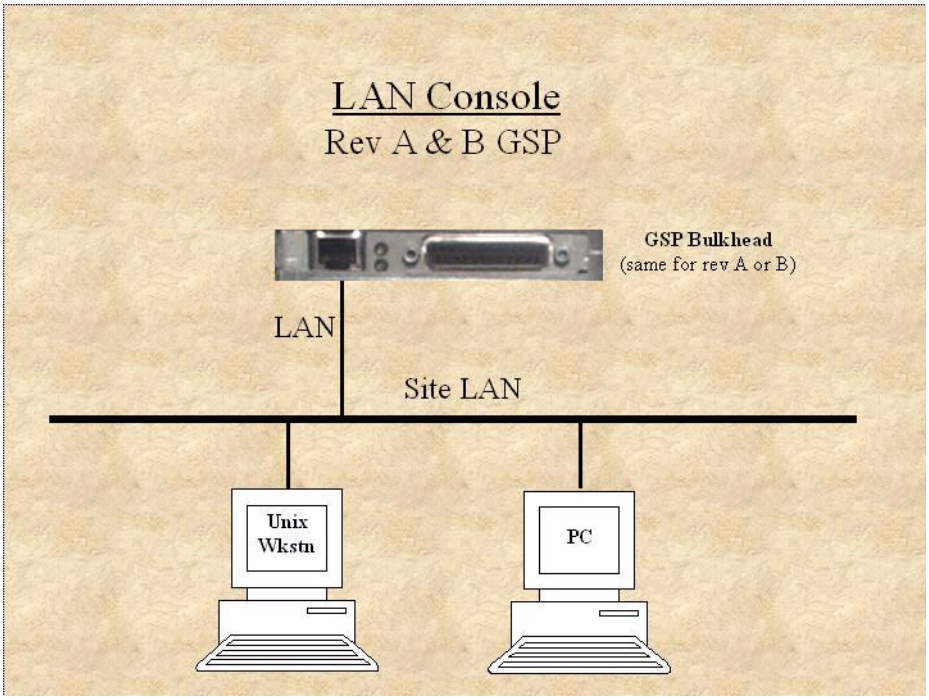
The remote console allows console access via modem connections. Below is an illustration of the REMOTE console.




The `GSP>ca` command is used to configure asynchronous settings for the REMOTE console. Baud rates and emulations should match between the modems, remote ASCII terminal and the GSP. Refer to, “Configure RS232 Console” for information about setting these values.

## Configure the LAN Console

The LAN console allows you to access the console from the LAN using TelNet or http (revision B GSP only) protocols. Below is an illustration of the LAN console.




The configuration of the LAN console of both the revision A and B GSPs may be done from either an ASCII console or the external Secure Web Console. For the revision B GSP, an IP may be assigned via LAN by pinging the LAN from a PC or workstation.

### Configuring the GSP LAN Port via an ASCII console

The LAN port of the GSP allows connection via TelNet or http connections. Once the LAN parameters are configured, the console may be accessed via a TelNet connection or via a web browser (revision B GSP only). The default IP of the GSP LAN is 127.0.0.1.

---

**NOTE** The GSP has a separate LAN port from the system LAN port. It will need a separate LAN drop, IP address, and networking information from the port used by HP-UX.
Before starting this procedure, you will need to know the following information:

- I.P. address (for GSP)
- Subnet mask
- Gateway address
- Hostname (this is used when messages are logged or printed)

---

To configure the GSP LAN port, perform the following steps:

1. Access the GSP with the ctrl+b entry.
2. At the GSP prompt, enter the LAN Configuration (lc) command:

```
GSP> lc
```

The lc command will start a series of prompts. Respond to each prompt with the appropriate information.

**Example 3-2 LC command**

```
Leaving Console Mode - you may lose write access. When Console Mode returns, type ^E
cf to get console write access.

GSP Host Name:  fesrhapgsp

GSP> lc

LC This command allows you to modify the LAN configuration.

Current configuration:

MAC Address: 0x00306e050a63

IP Address: 15.8.133.185

GSP Host Name: fesrhapgsp

Subnet Mask: 255.255.248.0

Gateway: 15.8.128.1

Web Console Port Number: 2023

Do you want to modify the LAN configuration? (Y/N)

GSP Host Name:  fesrhapgsp
```

The revision B GSP introduces a configurable Web Console Port Number parameter. The default value is 2023. Once the GSP LAN is configured, it is accessible via either TelNet or web connections.

### Configuring the GSP LAN Port via LAN

The revision B GSP LAN port can be assigned an IP address without using the LAN Configuration (lc) command via an ASCII console. This section describes how to assign the IP address allowing web access. Once web access is accomplished, use the lc command to configure remaining network parameters.

---

**NOTE** The GSP LAN port is separate from the system LAN port. It will need a separate LAN drop, IP address, and networking information from the port used by HP-UX.
Before starting this procedure, you will need to know the following information:

- I.P. address (for GSP)
- Subnet mask
- Gateway address
- Hostname (this is used when messages are logged or printed)

---

To configure the GSP LAN port via LAN, perform the following steps:

**NOTE** The GSP *must* be on the same subnet as the system being used to remotely configure the LAN port. If it is not, the remote configuration will be unsuccessful.

**Step 1.** Determine the MAC address of the revision B GSP by examining the GSP MAC address label on the rear of the server.

**Step 2.** Use the `route add` command to add the I.P address of the GSP and remote system to the router.

**Step 3.** Use the `arp` command to add an ARP entry for the IP address using the GSP MAC address.

- For HP-UX systems, the format of the MAC address is 00:30:6e:05:0a:ea
- For MS DOS systems, the format of the MAC address is 00-30-6e-05-0a-ea

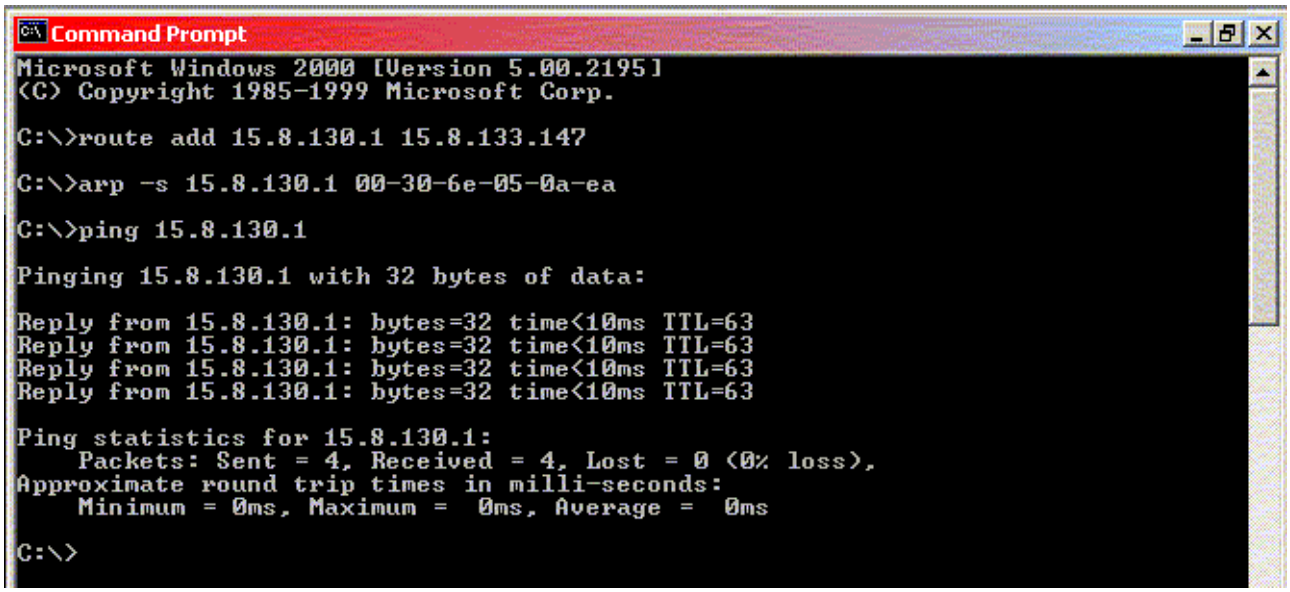
**Step 4.** Use the `ping` command to assign the I.P address for the GSP.

**Step 5.** The revision B GSP is now accessible via LAN. Access the GSP and configure remaining network parameters using the LAN Configuration (lc) command:

```
GSP> lc
```

The lc command will start a series of prompts. Respond to each prompt with the appropriate information.

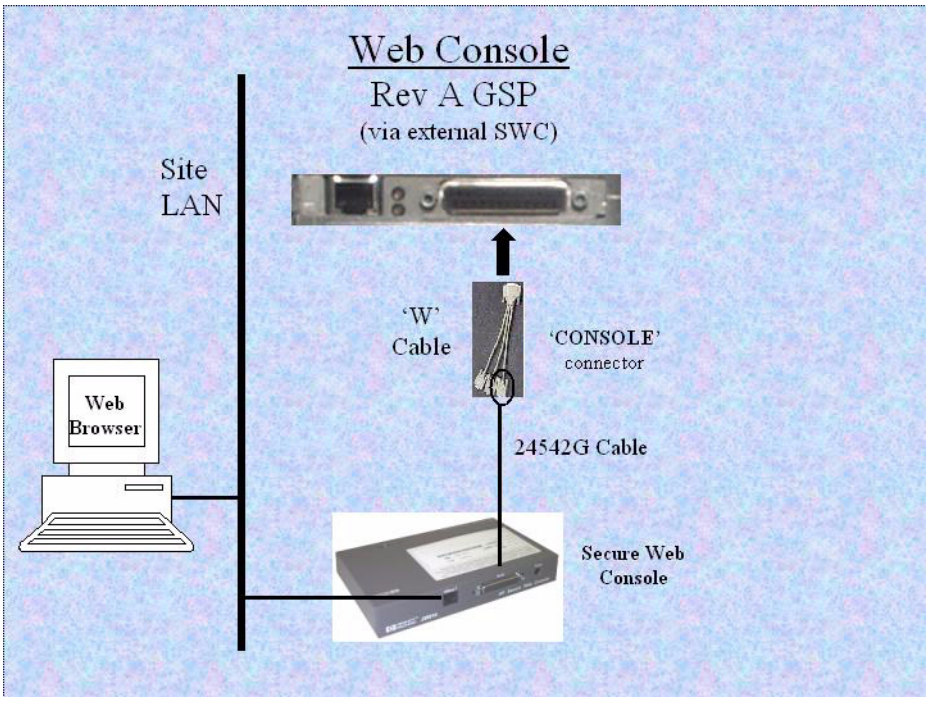
**Example 3-3 LAN Configuration from a PC**



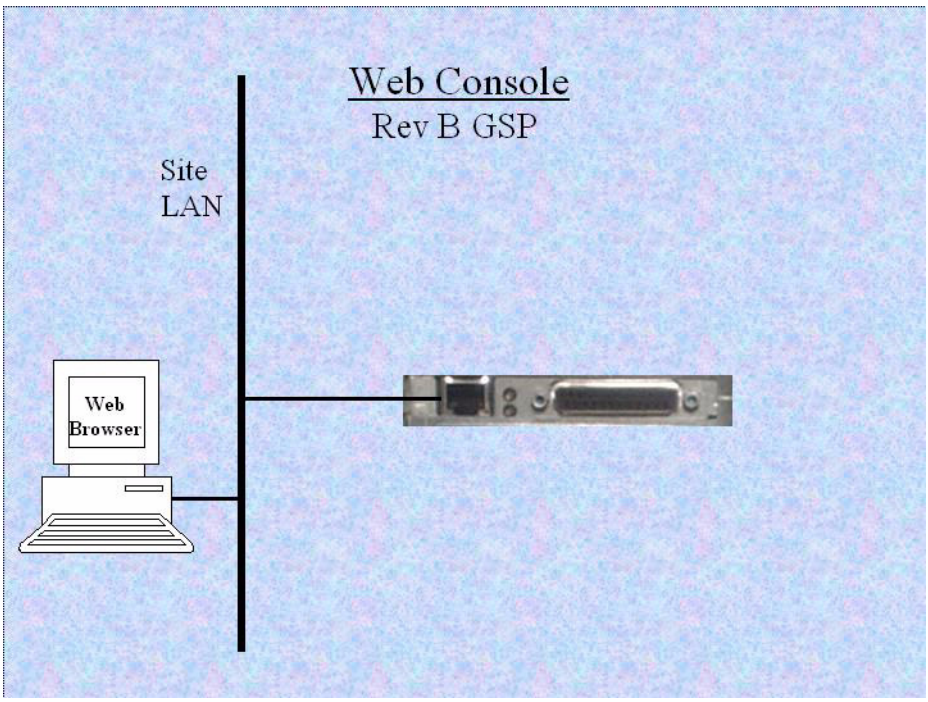

## Configure the Web Console

For the revision A GSP, the web console is accomplished via the J3591A Secure Web Console. Below is an illustration of the web console for the revision A GSP.

Refer to, “Install a Secure Web Console” for more information on Secure Web Console installation and configuration.



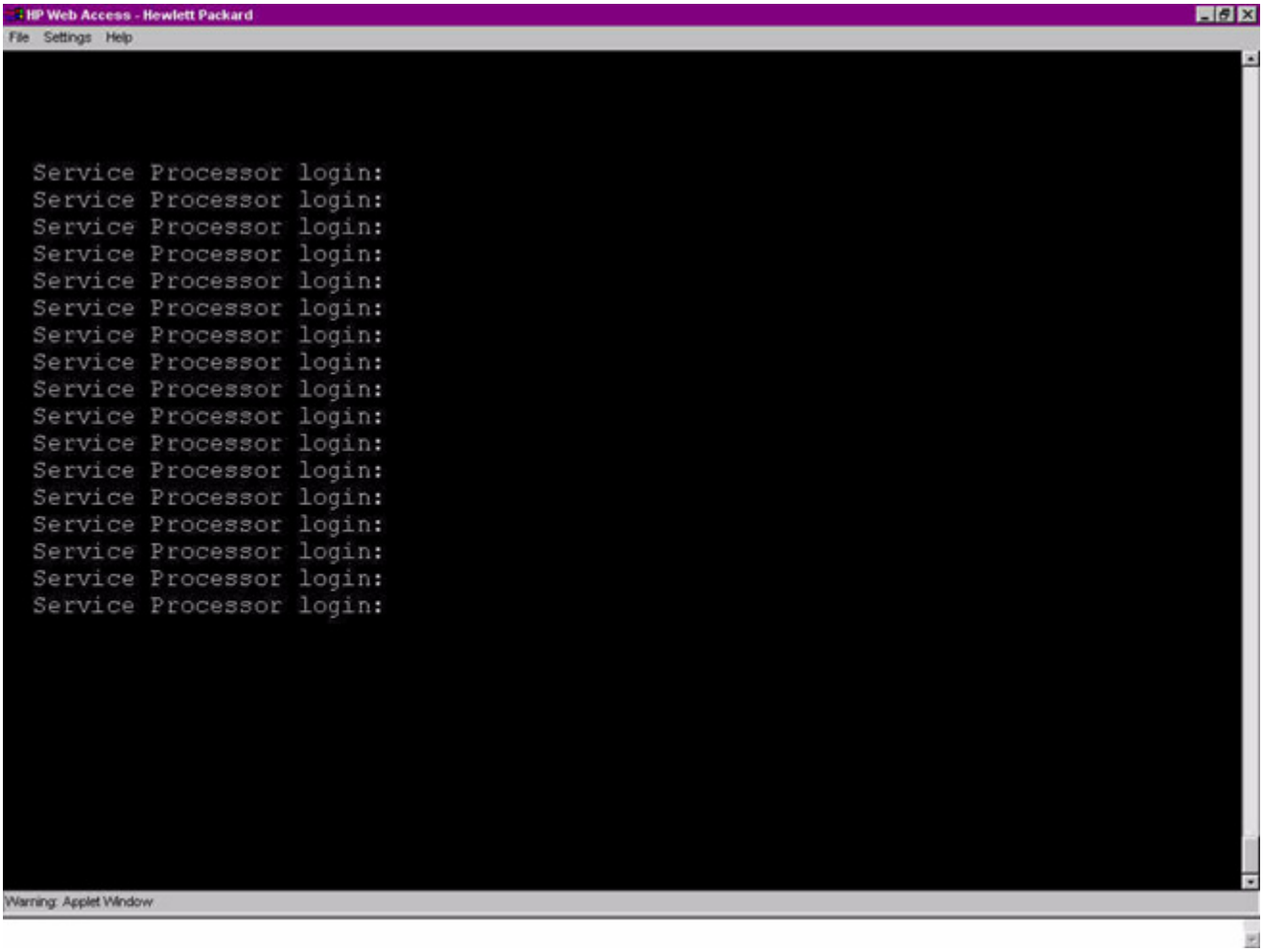

For the revision B GSP, the web console is an embedded feature. The steps to configure a web console are the same as configuring a LAN console. Refer to, “Configure the LAN Console.”




Once the LAN has been configured, access the web console by pointing a web browser, on the same subnet, to the IP of the GSP LAN.

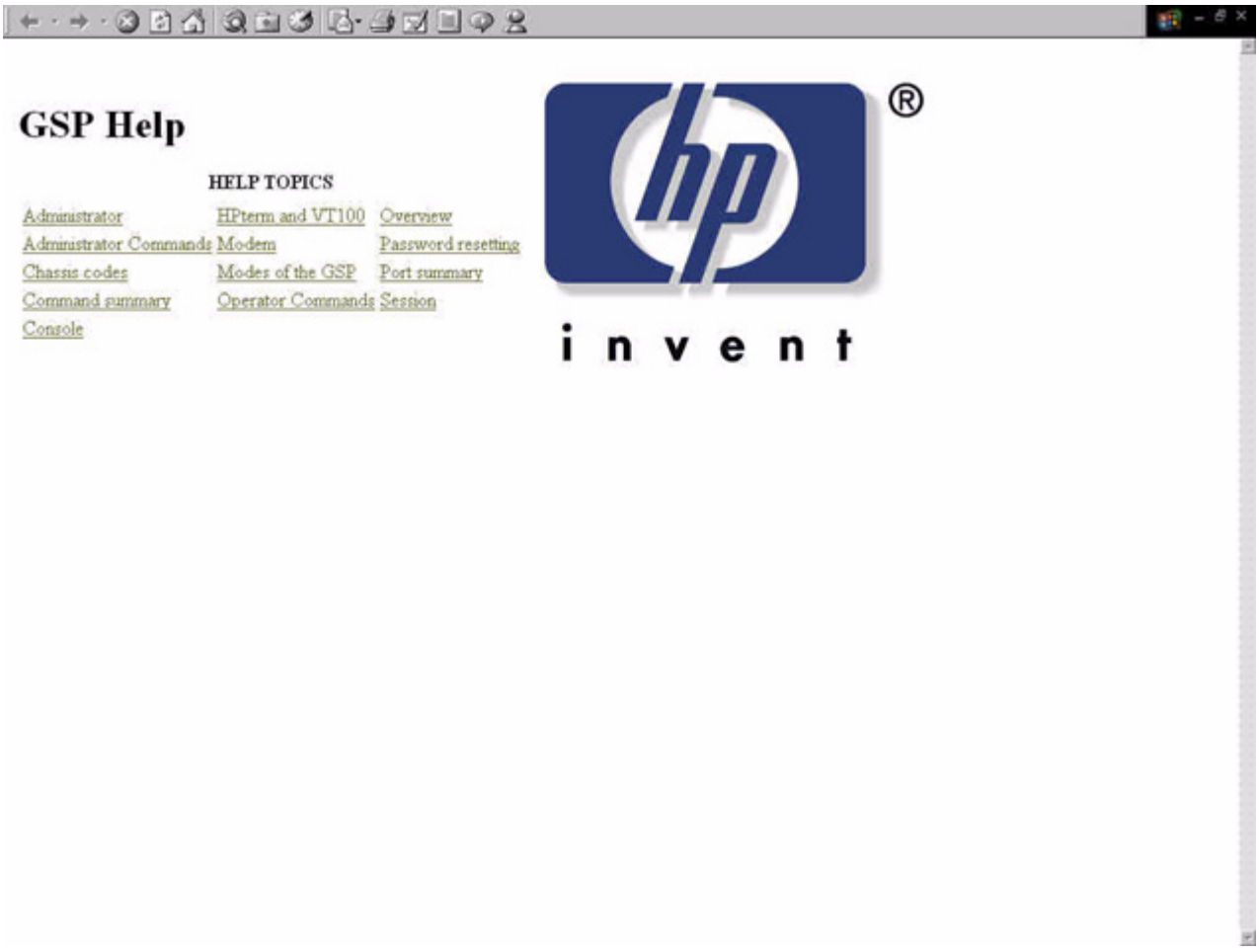
Two browser windows will appear: a window with a white background and the HP invent logo and a separate GSP window with a black background.

**Example 3-4 GSP Browser Window**



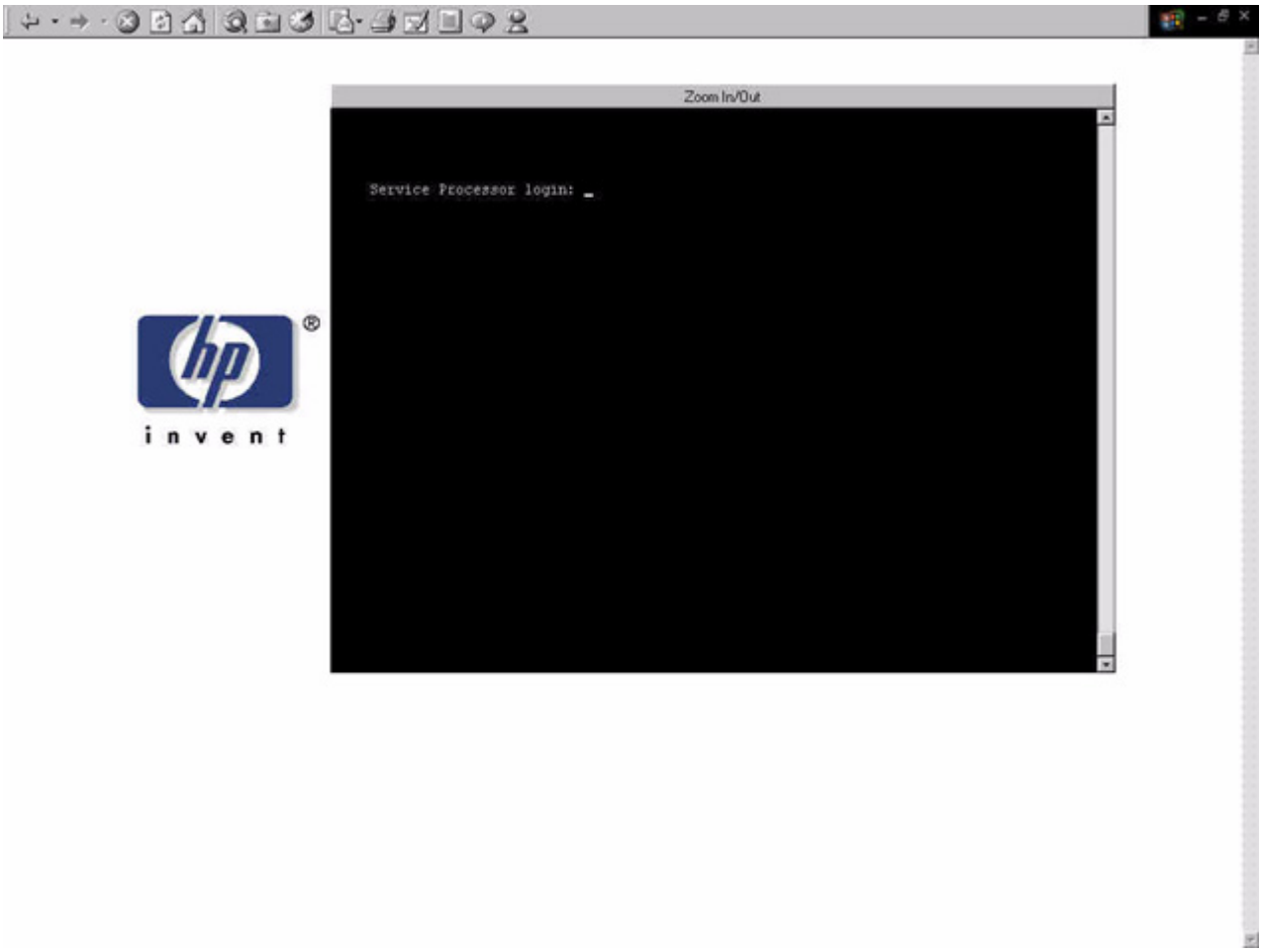

Use the SETTINGS menu bar to configure web browser emulation. The GSP window also has its own HELP facility.

**Example 3-5 GSP Web Browser Help Screen**




When the separate GSP window is closed, it appears in the HP invent window with Zoom In/Out above it. Click on the Zoom In/Out bar to generate a separate GSP window.

**Example 3-6 Combined GSP Browser Window**




There is not a separate administration “layer” when using the embedded web access of the revision B GSP. Web console access via the external Secure Web Console required that you first logon to the SWC, then click on ACCESS CONSOLE. User configuration was also performed at the Secure Web Console. However, the revision B GSP web console does not require this additional step. When you point the web browser at the IP of the GSP LAN, you are directly connected to the GSP. The web console part of the GSP employs the same users as the GSP.

# Secure Web Console Installation

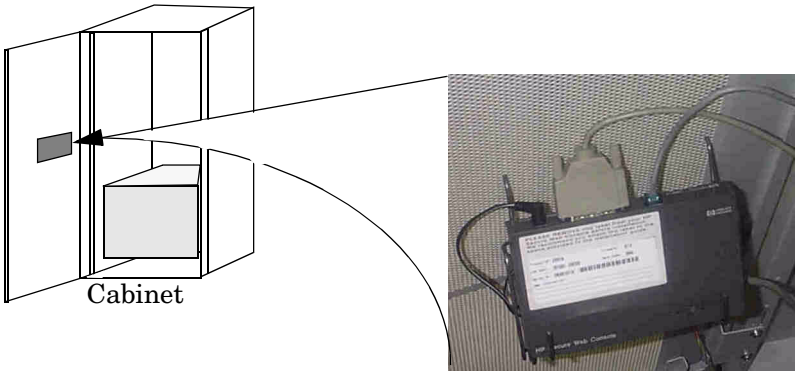
The following section describes installation of the HP Secure Web Console on inside of the rear door of a rack-mounted rp54xx Server.

For technical, installation, and configuration instructions for the Secure Web Console, refer to the following URLs on the Internet:

General information:
*http://www.hp.com/*

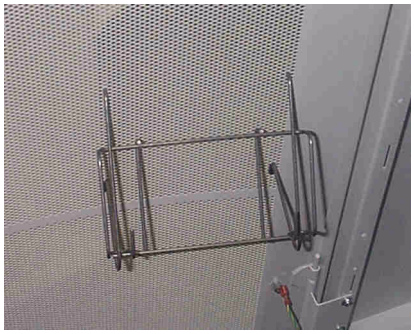
Documentation:
*http://www.docs.hp.com*

**NOTE** Either the system console (HP series 700 terminal) or the HP Secure Web Console may be installed on an rp54xx Server, but not at the same time. Both console types use the same DB9 type LAN *Console* connector.




To install the HP Secure Web Console on an rp54xx Server, refer to the previous figure and the HP Secure Web Console documentation, then proceed as follows:

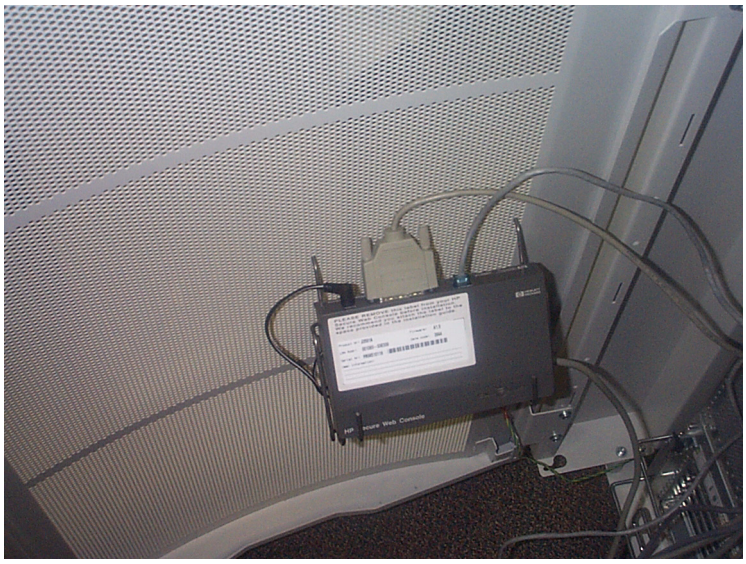
**Step 1.** Install the wire mounting bracket by carefully inserting the two top prongs through the vent grill in the rear door of the cabinet as shown above. Position the bracket toward the hinge side of the door.



Place the Secure Web Console power supply into the bottom portion of the wire mounting bracket as shown.

**Step 2.** Connect one end of the power cable to the power supply where indicated.

**Step 3.** Position the Secure Web Console unit in the mounting bracket.



**Step 4.** Connect the DC out cable from the power supply to the Secure Web Console.

**Step 5.** Connect one end of the AC power cord (supplied) to the Secure Web Console power supply.

**Step 6.** Connect the other end of the AC power cord to an available receptacle.

On a PDU if in a cabinet.

In an available wall outlet if in a Deskside enclosure.

**Step 7.** Connect the 9-pin end of the RS-232 cable (Supplied) to the connector labeled CONSOLE on the A5591-63002 “W-type” adapter cable.

---

**CAUTION** To prevent unauthorized access to your rp54xx system, do not connect the other end of the serial cable to the Secure Web Console until both the server and the Web Console have both been fully configured.

---

**Step 8.** Connect one end of a LAN cable to RJ-45 connector labeled 10-Base-T on the Secure Web Console.

**Step 9.** Connect the other end of the same LAN cable to your site LAN.

**Step 10.** Configure the Secure Web Console in accordance with the documentation that was provided with it or refer to *http://www.docs.hp.com*

**Step 11.** Once the Web Console has been properly configured, the remaining end of the serial cable between the server and the Web Console may be connected.

# GSP Configurable Parameters

Once a system console is configured, additional GSP parameters may be set. For a complete list use the `GSP>he` command to access the on-line help facility.

Examples of three configurable parameters follow.

## Adding Users

The GSP provides a maximum of 20 users (one administrator and 19 operators). By design, the first user added to the GSP becomes the GSP administrator. Only the GSP administrator can add or remove users or change the GSP configuration.

**NOTE** Before starting this procedure, you will need to know the following information:

- User's name
- Organization's name
- Login name
- User's password

To add a user, perform the following steps:

1. Access the GSP with the ctrl+b entry.
2. At the GSP prompt, enter the Security options and access control (SO) command:

   ```
   GSP> so
   ```

3. The first prompt you will see with the so command is for GSP wide parameters:

   ```
   GSP wide parameters are:
   Login Timeout: 1 minutes.
   . Number of password Faults allowed: 3
   . Flow Control Timeout: 5 minutes.
   Do you want to modify the GSP wide parameters? (Y / N) __
   ```

   At this point you can modify the GSP wide parameters, or continue with adding users. To add users, respond N for no.

**NOTE** If this is the first time users are being added, the first user added will be the GSP administrator.

If this is not the first time you are adding users (you are adding additional users), you will need to step through all current users to reach the next available user prompt.

4. The next prompt that appears will ask the following question:

   ```
   Do you want to modify the user number 1 parameters? (Y/N/Q to quit) __
   ```

   Follow the series of prompts to enter all the required fields for adding a user.

**CAUTION** Be sure to read each prompt carefully and enter the correct response. A missed or incorrect entry could deny entry to that user.

The following is an example of an added user's information:

```
. User's Name: Joe Smith
. Organization's Name: IT Support
. Dial-back configuration: Disabled
. Access Level: Operator
. Mode: multiple
. User's state: enabled
```

For the number 1 user, the Access level is administrator. The Mode entry of single only allows entry for that user one time, then access will be denied. A Mode entry of multiple allows unlimited entries into the GSP.

## Removing Users

You can remove (disable) a GSP user with the same Security options and access control (SO) command used to add a user.

To remove a user, perform the following steps:

1. Access the GSP with the ctrl+b entry.
2. At the GSP prompt, enter the Security options and access control (SO) command:

   ```
   GSP> so
   ```

3. The first prompt you will see with the SO command is for GSP-wide parameters:

   ```
   GSP wide parameters are:
   . Login Timeout: 1 minutes.
   . Number of password Faults allowed: 3
   . Flow Control Timeout: 5 minutes.

   Do you want to modify the GSP wide parameters? (Y / N) __
   ```

   At this point you can modify the GSP wide parameters, or continue with removing a user. To remove users, respond N for no.

**NOTE** You will have to step through each user number until you reach the user to be removed.

4. When you access the number of the user to be removed, you must change the data in the prompts for that number.

   It is important that, at a minimum, you need to modify the User's state to Disabled.

## Return the GSP to Default Configurations

The Default Configuration (dc) command is used to reset all or some of the GSP values to the default values. To return GSP values to default configurations, perform the following steps:

1. Access the GSP with the ctrl+b entry.
2. At the GSP prompt, enter the Default Configuration (dc) command:

   ```
   GSP> dc
   ```

3. Follow the prompts for the dc command, and be sure to have the change information available.

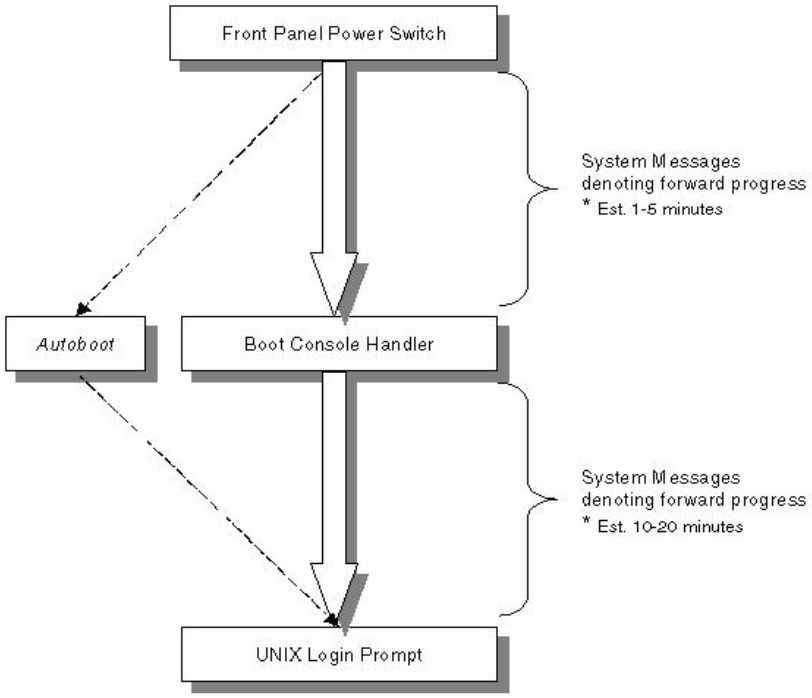
**CAUTION** When the Security configuration is reset, all users are removed, including the GSP administrator. It also disables the remote. Remote must be re-enabled through the main console using the Enable Remote (er) command.

# rp54xx Server Boot Process

The length of time an rp54xx Server will require to complete the boot process depends on the number of processors and the amount of RAM installed. Average configurations can take more than 20 minutes.

The boot process consists of the following main steps:

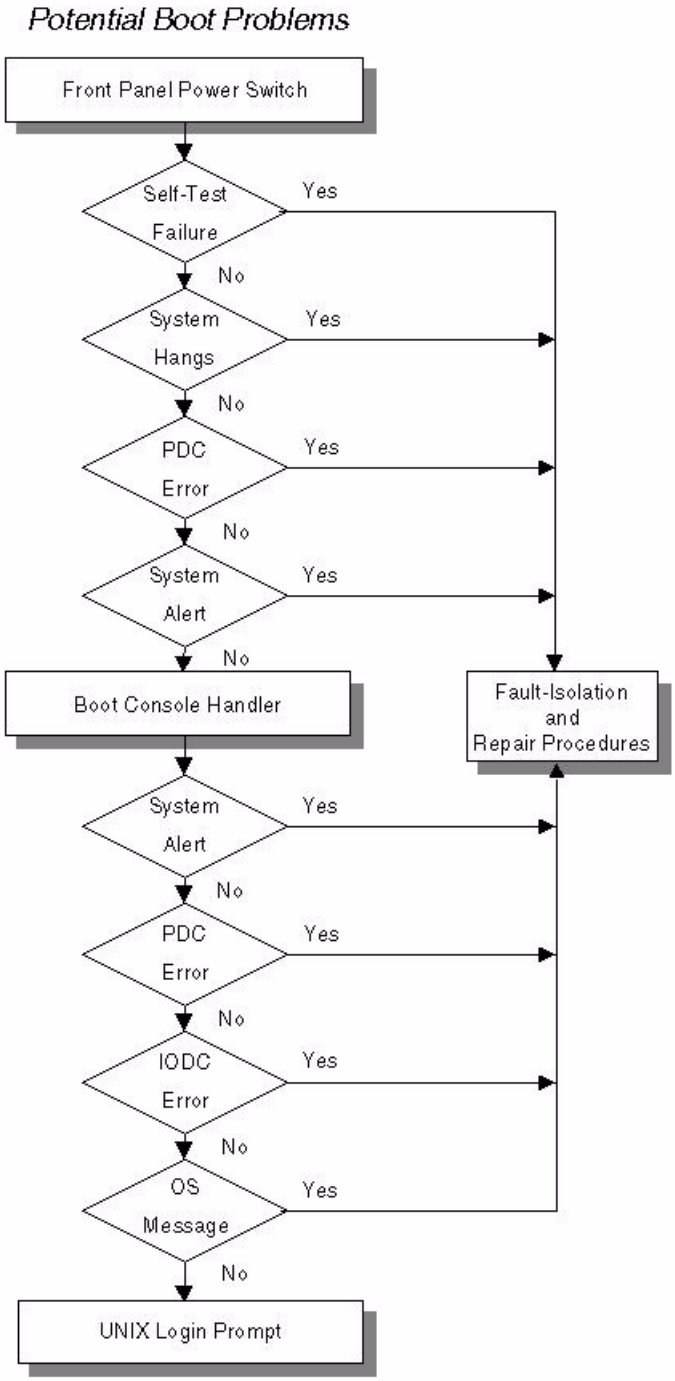
*Typical Boot Process*




The duration of the full boot process can vary depending on:
- Number of CPUs installed
- Amount of memory installed
- UNIX version installed
- State of the network

All times approximate

During the Boot process a variety of errors or problems can occur as shown below:

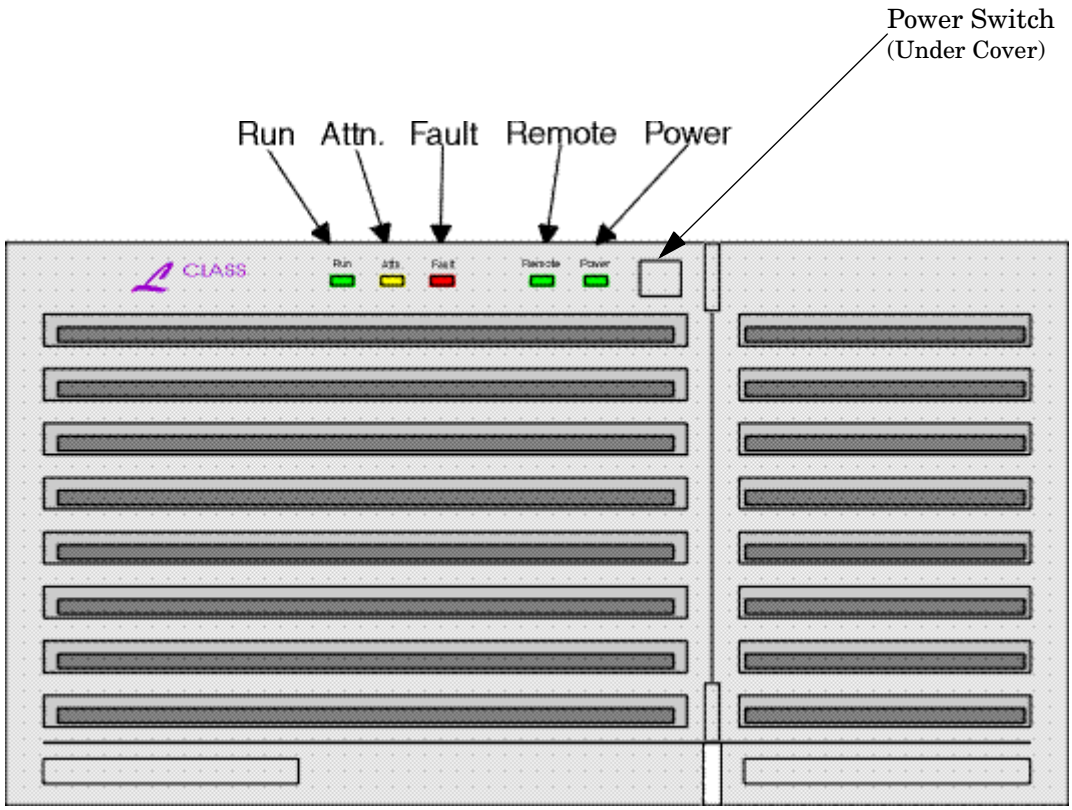


## Initial Power-up

The following section describes the process of applying power to the rp54xx Server and booting the system to the UNIX Login prompt. The amount of time it takes to go through self-test then boot the system will vary widely depending on hardware configuration. The following provides a “typical” procedure. Yours may vary depending on software and hardware installed:

**Step 1.** Apply AC Power to the system console.

**Step 2.** Apply power to the rp54xx Server by turning the front panel switch to ON.



**Step 3.** Several self-test boot progress screens will be displayed and will scroll rapidly up the screen. Some tests may pause for up to one minute while the test completes.
The following examples of the forward progress screens are typical of the screens displayed.

Brief

```
********************************* EARLY BOOT VFP ******************************

0x0000180089002380 00000000 00000000

Q/q: quit Virtual Front Panel Display
->Choice:
*******************************************************************************
```

Verbose

```
******************************** EARLY BOOT VFP ******************************
ALERT LEVEL: 0=No failure detected, forward progress
PROBLEM DETAIL: 0=no problem detail - SOURCE ID: 00
SYSTEM NAME: fespre2sas
MODEL NAME:   MODEL STRING:   S/N:
SPU POWER: ON
ACTIVITY/COMPLETION LEVEL:  0%
SYSTEM BOOT IS PENDING

LEDs:  RUN      ATTENTION     FAULT     REMOTE
       FLASH    FLASH         OFF       ON

CALLER ACTIVITY: 1=test - CALLER SUBACTIVITY: A4=implementation dependent
REPORTING ENTITY TYPE: 0=system firmware - REPORTING ENTITY ID: 01
SOURCE: 7=memory - SOURCE DETAIL: 0=unknown, no source stated

0x78001800700001A42 00000000 00000001 - type 15 = Activity Level/Timeout

Q/q: quit Virtual Front Panel Display
->Choice:
*******************************************************************************
```

**Step 4.** When the initial power-up boot process completes in approximately one to five minutes, the BCH main menu will be displayed:

```
---- Main Menu -------------------------------------------------------------

     Command                            Description
     -------                            -----------
     BOot [PRI|ALT|<path>]              Boot from specified path
     PAth [PRI|ALT|CON|KEY] [<path>]    Display or modify a path
     SEArch [DIsplay|IPL] [<path>]      Search for boot devices

     COnfiguration menu                 Displays or sets boot values
     INformation menu                   Displays hardware information
     SERvice menu                       Displays service commands
     DeBug menu                         Displays debug commands
     MFG menu                           Displays manufacturing commands

     DIsplay                            Redisplay the current menu
     HElp [<menu>|<command>]            Display help for menu or command
     RESET                              Restart the system
----
Main Menu: Enter command or menu >
```

**Step 5.** To start the boot process using the primary boot path, enter **BO PRI**, at Boot Console Handler BCH main menu prompt and press **ENTER**.

---

**NOTE** Booting a system to a UNIX login prompt from BCH main menu can take 20 minutes or longer depending on your software and hardware configuration.

---

**Step 6.** Once the system reaches the UNIX login prompt the following will be displayed on the console screen:.

```
HP-UX hprfes A.09.04 U 9000/897 (ttyp2)

login:
```

# Index